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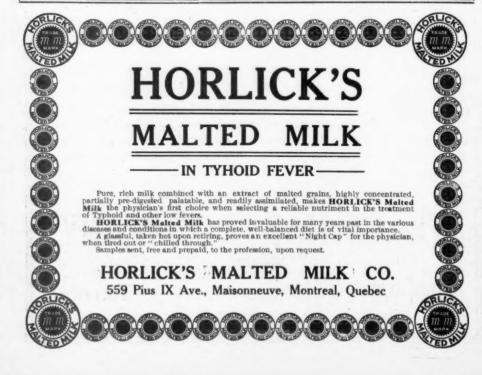


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Mrs. Exe: No, I haven't time for that; just to buy some things that I need.—Boston Transcript.

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"What's it for this time?"

"This time I get married."

"So soon? Why, it's only been a few weeks since you buried your wife."

"Sure!" said Frank, "but I don't hold spite long."—Harper's Magazine.

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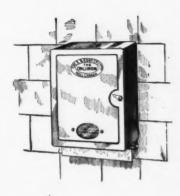
"Excuse me, sor," said Murphy, "but what kind of soil have ye here?"

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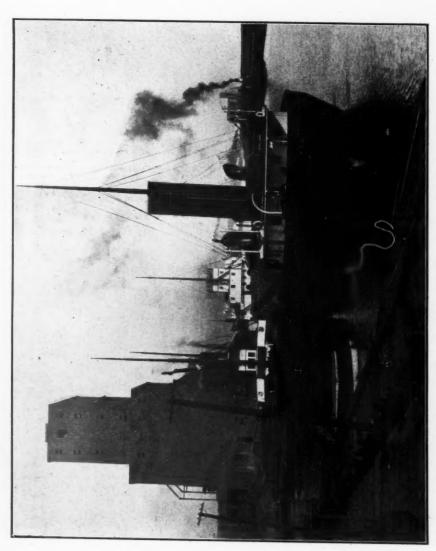
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Public Health Journal

TORONTO, CANADA, AUGUST 1914

NO. 8

PUBLIC ABATTOIRS

By J. T. J. VALLANCE

Sanitary and Plumbing Inspector, City of Lethbridge, Alta.

Read before the Third Congress Canadian Public Health Association, Regina.

7 HILE I feel that this subject is by far too big to be dealt with as comprehensively as it deserves in a paper that necessarily has to be very brief, I trust that I have succeeded in placing a few of the most essential points for consideration before you in such a manner as to arouse interest in what is going to be a live question in our country in the very near future. I am indebted for a great deal of my information to Mr. R. Stephen Ayling, whose paper on Public Abattoirs was read before the Royal Institute of British Architects in 1909, and who, I believe, is looked on as a specialist on this subject in England; and to Messrs. C. Cash, B.A., and Hugo Heiss, Abattoir Director of Strauberg, Bavaria, who have published a book entitled "Our Slaughter House System" and "The German Abattoir," which is a comparison between the old fashioned and insanitary system of private slaughter houses still in vogue to a very great extent in England, and the modern perfectly designed and equipped abattoir in use in almost every community in Germany. In addition to these sources of information, I obtained particulars of the Municipal Abattoir established in Paris, Texas, in 1909. The whole subject has been thoroughly dealt with at great length by the various writers I have mentioned, together with a great many others not mentioned, and I desire to confine myself to the task of summarizing as far as

possible the aspects which appear to be especially applicable to the conditions existing in the cities of our own country, more particularly in the West, and to try to point out the need for, and the advantages that would result from the establishing of municipally owned and operated abattors.

There may be people who will question the wisdom of a city building an abattoir, thinking it is encroaching on the business of the butchers. There can be no possible doubt that it is the business of city authorities to improve the sanitary condition of their city, and among such improvements we must count the erection of an abattoir. Consequently, under no conditions should the municipal authorities surrender their rights in this matter. If a sanitary institution of this kind is the property of the city, the citizens are assured that its management will be above suspicion, and that proper supervision will be exercised. Moreover, all those who make use of it will have the benefit of the latest modern appliances and improvements, a circumstance which may well reconcile them to the new system. If, on the other hand, a city or town cedes its right to build an abattoir, whoever undertakes to do so will be tempted to make money out of the venture and the municipality may be subsequently blamed, and reasonably so. because the price of meat has risen.

The absolute necessity for such build-

ings must be apparent to anybody who has made even the slightest investigation into the conditions under which the meat sold in our towns is slaughtered and There are few private slaughter houses on the outskirts of Western cities but what could be closed on the ground of insanitation. In most cases the floors are badly constructed of wood, laid with little or no attention as to proper drainage, and what drainage there is usually goes into the hog pen at the rear of the main building, into which also the entrails of the animals slaughtered are thrown. But apart from the objections to private slaughter houses on the ground of their sanitary defects and unsuitable situation, there is another far more serious objection, which would still exist even were each private slaughter house in its construction and appointments equal to the best built abattoir. This objection consists in the impossibility of proper meat inspection when cattle are slaughtered in private slaughter houses scattered over a large area. Even if there were a qualified veterinarian appointed to make the inspection, killing takes place at all times, and it would be impossible for him to inspect all the meat slaughtered, except at one place. Besides the impossibility of effectual meat inspection there is, however, another evil which results from want of proper supervision under the private slaughter house system. That evil consists in the absence of the check on cruelty which publicity or supervision affords. Not that I mean to impute that butchers are deliberately cruel, but by cruelty I mean the infliction of avoidable suffering. If an animal is stunned or otherwise rendered unconscious before blood is drawn, its death is rendered comparatively, if not absolutely, painless. The animal bleeds equally well whether it has been stunned or not, and the fact that the butcher stuns his bullock-not, however, from motives of humanity, but because of the difficulty of controlling a large and powerful animal-proves that he has no objection to the practice. The various appliances which have been invented during recent years for stunning animals, such as "Greener's Humane Cattle-killer" and the German slaughtering pistol, leave the butcher who is really humane little excuse for

slaughtering in the old and barbarou way.

There are a number of reasons which make a public abattoir of benefit to but Modern abattoirs are built ex pressly for the purpose they are intende for, with abundant air, light, space and water, so as to ensure the greatest possibl cleanliness, the result being such system and cleanliness as are hardly dreamed o in the case of a private slaughter house An abattoir which is properly worked wil have its own well trained staff for slaugh tering operations, and thus not only wil animals be spared unnecessary pain, bu butchers will be able to do their work wit a proportionately smaller staff than wa previously possible. The butcher can but any number of cattle which may suit hir and send them to the abattoir to b slaughtered; all he has to do after payin the slaughtering dues is to receive th carcases and deal with them as he may please. The abattoir supplies him with cold store, which guarantees the preservation of his meat for weeks in perfect condition without any deterioration from natural causes. All slaughtering offal-hides, horns, hoofs, fat, blood and bristle -can be converted into marketable pro duce on the spot without any subsequen trouble to the butcher in any way of stor ing or preserving. If conditions require it, there could be a cattle market connect ed with the abattoir by means of which the butcher would be enabled to buy suc cattle as he may require direct from th farmer. All these advantages will strik any butcher who conducts his business of rational lines.

The public also derives advantages from the establishment of an abattoir over an above the improved conditions to which I have already referred. The mutual in spection for which there is ample oppor tunity in a public slaughter house and th possibility that meat of an inferior qual ity may be subjected to scathing criticism will act on the butchers as an inducemen to purchase only the best cattle the man The obvious cleanliness pre ket offers. vailing in the abattoir will make the mea offered for sale more attractive and ensur its being speedily disposed of. The saus ages manufactured at public slaughte houses are above suspicion, and purchaser may consume them without apprehension, in the full knowledge of what they are

composed.

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The trade of cattle raisers and dealers will also benefit from the fact that infectious and contagious diseases are more readily discovered, and consequently more quickly stamped out, thus preventing the loss of whole herds, such as has been experienced by owners of hog ranches, owing to the introduction of hog cholera.

The two chief arguments brought forward against the proposal of a civic authority to establish a public abattoir are: first, that the abattoir dues will cause the price of meat to rise, and, second, the initial expense coupled with the fear that the institution will not pay its

wav.

It may seem inconsistent, after laying so much stress on the sanitary and public health aspects of the question, to even discuss the question as to whether public abattoirs can be made to be self-supporting, as it would appear that such institutions are a necessity, and whether they are conducted at a profit or a loss is more or less immaterial. Experience has shown, however, that when a public abattoir is built, suitable for the needs of the district, properly managed, and the surrounding private slaughter houses compulsorily closed, they can be, and should be, self-supporting or profitable. Even in England, where the people are only just waking up to the importance of the question, of the many public slaughter houses, small and out of date as most of them are, and competing as they do with the private slaughter houses, forty-one per cent. of them are either self-supporting or profitable, even in face of the fact that in Birmingham there are about 131 private slaughter houses, in Manchester 90, in Leicester 78, and so on indefinitely, all competing with the one abattoir in each city. In his book on "The German Abattoir," Herr Carl Heiss states that in Germany, every one of the public abattoirs, and there are many hundreds, is without exception profitable, that the profits go towards reducing the rates, and that meat food has decreased in price and improved in quality. When we consider that the German and other continental abattoirs are erected on a scale of magnificence that would never be dreamed

of in Canada or England, this result is all the more astonishing. There have been in several instances temporary rises in the prices of meat following the establishing of an abattoir, but in every case they soon went down to their normal level. In most cases the temporary rises were due not to the abattoir, but to other causes, such as the scarcity of live stock. A veterinary surgeon in Europe took the trouble to send out inquiry forms to five hundred and sixty towns possessing abattoirs. The answers he received are sufficient to refute any theory of a rise in the price of meat. He finally sums up the purport of these answers in the following statements:

1. Meat is not rendered dearer by compulsory public slaughtering and meat inspection.

2. Public abattoirs are always able to pay interest on the original outlay.

3. Any rise in the price of meat which may be noticed is really due to the relation between supply and demand. Such prices are to be noticed before an abattoir has been established.

4. The quality of meat always improves after an abattoir has been opened, therefore in a certain sense the price of meat

is lowered.

5. The price of meat often goes up directly an abattoir is opened. The butchers attempt to bring about such a rise. consequence, however, of competition and the greater amount of meat imported when prices are raised, they soon revert to their former level.

6. The price of meat in towns where public slaughtering and meat inspection are enforced by law is not higher than in neighboring towns where no such system

of compulsion exists.

7. The butchers have as much freedom in the exercise of their vocation as formerly, since everyone who complies with the regulations of the abattoir and pays the fixed tariff for its use, is fully entitled to slaughter or have slaughtering performed there.

Of all the places possessing abattoirs, the one where conditions and circumstances seem to be most like those existing in Western Canadian towns and cities, is Paris, Texas. Paris is a town of about fifteen thousand inhabitants, not differing materially from other progressive towns of its size. It has a number of factories, including a large crate factory, furniture factory, cold storage plant, cotton oil mills, etc. Prior to the construction of the municipal abattoir, there were a number of private slaughter houses in and around the city, most of them rudely constructed, located on damp low ground; usually the only water available was from shallow wells or pools. Everything about them was The municipal officers had unsanitary. sought to improve the conditions, but the slaughter houses being outside the town were beyond their immediate jurisdiction. Efforts were made to induce the several butchers to combine or form a joint stock company, to build and operate a modern plant under city inspection, but business rivalries prevented this plan from coming to anything. Finally, under the leader-ship of the Mayor, plans for a modern abattoir, cold storage and rendering plant were secured, a bond issue to obtain the necessary funds was authorized by populer vote, and the abattoir was promptly erected. The accepted plans were made by Wannenwetsch & Company, Buffalo, N.Y., who also furnished the outfit for the rendering plant. The abattoir is located on one of the principal streets near the corporate limits of the town, with dwelling houses on all sides of it. The buildings are constructed of wood and corrugated iron, with the exception of roof, foundations and floors, the latter being of concrete. The reduction, killing and cooling rooms are all two storeys in height, while the engine room, office and dressing rooms are one storey. In writing to a Chicago paper on the matter, the Mayor of Paris, Texas, states that if the plant were to be reconstructed the cold storage and chill rooms would be built of brick or cement, and the reduction room would be removed to a distance of at least fifty feet from the balance of the plant. Immediately adjacent to the building are stock pens, platform scales and the necessary runways to properly facilitate the handling of animals for slaughter. The plant is large enough to take care of about fifty head of cattle per day of ten hours, but, in addition to cattle, hogs and sheep are also slaughtered. The city does not purchase any animals or sell any meat; it merely slaughters under sanitary conditions, the animals

that are offered by the local butchers who wish to avail themselves of the facilities offered.

The use of the municipal plant is not made directly compulsory, but by ordin ance it is provided that all animals musbe slaughtered in some plant which has all the various sanitary precautions and equipment maintained at the municipal plant. As a result, all local slaughtering is done at the city abattoir. The killing room is well lighted and perfectly screen ed. All doors are double screened and have vestibules. The floors are of concrete carefully laid to grade, and the entir surface trowel finished. At the low point trapped floor drains are connected to th city sewers. Overhead is a complete sys tem of steel tracks and travelling trolleys so laid out as to facilitate in every possibl way the handling of all animals from th knock-down pen out to the inspector's rai and into the chill room. In this room als are the scalding vat and the inspector' tables. The chill room is ten feet wide twenty-one feet long and seventeen fee eight inches high, the walls being insulated with two layers of 1½ inch waterproof Th lithboard laid in antiaqua cement. cooler room, immediately adjoining, is 2 ft. x 21 ft. x 17 ft. 6 in. in size, and is seg arated from the chill room by a partitio insulated with Lith. All wall and ceilin insulation is finished with two coats of Portland cement. Above both chill room and cooler are bunker rooms or coil lof about four and a half feet high, for th direct expansion piping which takes u the heat arising from the meat hung on th rails in the rooms below. The drip from these pipes when frost melts off is caugh in pans and trapped out of the buildin Dry refrigeration is thus assured, and a carcass ever comes out dark and slimy. the cooler a temperature of about thir degrees Fahrenheit is maintained, and the chill room about forty degrees Fahre Thus the meat does not require be thawed when removed from the stor while it will keep in a perfect state of pr servation for several months if kept at th temperature.

The rendering room is equipped with Wannenwetsch rendering machine, grease tank, overhead tracks and the recessary hand and steam hoists. All off s who from the killing rooms and all dead stock eilities from in and around the city are put into the tank in this room. After a charge is put in, the tank is hermetically sealed and s not not opened until the finished products are ordintaken out, after three to six hours' treatmust ment, by which time they are practically h has odorless. The gases and odors that are and not condensed and trapped into the sewer icipal are passed under the firebox of the boiler tering and consumed there. The products of the rilling rendering tank are tallow and tankage. creen-The tallow is readily purchased by launand drymen and soapmakers at from five to crete, five and a half cents per pound. The entire tankage produced is worth by chemical points analysis as a fertilizer \$23.50 per ton, but o the this is sold principally at planting time e sysand must be stored at other seasons. olleys, effort is made to utilize any other by-prossible duct, such as hoofs for glue, bristles from n the hogs, tail switches of cattle, etc. The res rail frigerating plant is rated at about ten tons n also ctor's capacity per day of twenty-four hours. A thorough system of inspection is maintainwide. ed, the chief inspector being a graduate feet veterinarian who has had a special course sulatof instruction under skilled Government proof inspectors. Two inspections are made, one The is 27 of the live animal and one of the carcass. If animals are rejected on live inspection s septhe owners are notified, and the animals tition are at once removed from the pens, but if eiling the rejection is determined upon in the ts of killing room the carcass is tanked and the room lofts owner is allowed what it is worth in tallow and tankage. In addition to the inspector, r the the regular employes include an engineer, s up two slaughterers, one driver and one deadn the stock man. The charges made are \$1.25 from for each beef and seventy-five cents for aught These each calf, hog, sheep or goat. ding. charges cover the two inspections, slaughad no tering, five days cold storage and delivery 7. In thirty on the hook in the butcher's shop. If any nd in carcass is left in the refrigerating rooms longer than five days a charge of ten cents hrenper day is made. The plant complete cost re to

ten thousand dollars.

A few preliminary considerations in deciding to build an abattoir are, first, the site, second, the size, third, the cost, and fourth, errors to avoid.

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With regard to the site, the main consideration is that it must be served by both water and sewer. The road or roads ap-

preaching the abattoir should be broad and well made. Another point, the importance of which can be hardly overestimated, is that the abattoir should be in immediate connection with the railway. The transport of cattle will be greatly facilitated by this arrangement, and another advantage is that it obviates the driving of cattle through the public streets in many cases. The site should also be conveniently situated with regard to obtaining electricity, both for power and light. It might also be convenient to have the plant erected near to an incinerator, should there be one, thus probably effecting a saving in the cost of operating.

As to size, in calculating the size and capacity of a public slaughter house, the first point to be clear about is the size of the population for which it is required. The growth of the population must be allowed for, and also the likelihood that the demand for meat will increase. In ordinary cases a good basis of calculation is the number of the population plus one-half, but in view of the rapid increase in population of some communities, this might not be sufficient in all cases. It is much easier to make an establishment that is a little larger than is absolutely necessary, and pay interest on the capital outlay, than it is to alter or enlarge one that has been planned on too small a scale. In any case the possibility of a continued increase of population ought to be carefully borne in mind in planning every section of the building. Care should also be taken to arrange that it is possible to make extensions while business is being carried on and without interfering with the work of the abattoir. Finally, the greatest attention should be given to the three essentials in an abattoir-air, light and space.

As to the cost. This is a difficult subject to speak on. The way in which the work is carried on, the choice of an architect, the cost of materials, and the rate of workmen's wages, must all be taken into account. One town may take a pride in having a handsomely appointed abattoir, while another considers that the simplest which can be built is quite expensive enough. Simplicity of construction, combined with good materials and proper efficiency is what should be aimed at. I do not think that an abattoir fulfilling these

conditions could be built in Western Canada for the figure quoted as the cost of the Paris, Texas, plant, but rather believe that such an abattoir would cost considerably more.

Errors to avoid. In order to avoid the worst mistakes in building an abattoir, it is advisable to have technical advice, and the plans for the building laid down in consultation with an expert on abattoi: matters. The chief structural defects arise from neglecting the three essentials in an abattoir previously mentioned, light, air and space. Narrow passages and low slaughtering halls are especially objectionable. Nor is it wise to shirk the expense of using first-class materials throughout. Such expenditure is amply compensated for in after years by the small amount which is required to meet depreciation; whereas, when inferior materials are employed, the constant need for repairs is an unpleasant source of expense. As an instance—the City of Paris apparently regrets having used wood and corrugated iron instead of brick or cement for their cold storage and chill rooms. The thorough ventilation of the slaughtering hall or killing rooms is another point which should be attended to. In a modern abattoir the air should be so pure that nothing reminds one of the use to which the building is put. The presence of draughts should be avoided; by properly arranging and connecting the different rooms. workers in an abattoir are often in profuse perspiration and cold draughts would be injurious to their health. In a killing room for pigs, care should be taken that the steam from the scalding tanks does not find its way into the hanging rooms. The cold storage should not measure more than 9 ft. 10 in. in height, as otherwise more money is required to work it. The working of the cold store always increases the expense of working the abattoir, and therefore

all unnecessary space should be saved. On the other hand, no expense should be spared to ensure absolute insulation; the walls must be non-conducting. Any economy that may be attempted in this respect when the building is being constructed will make itself subsequently felt in the form of higher working expenses, and cannot be remedied without serious interruption of business.

Above all, full attention should be given to observing the principles of hygiene. It was hygiene that first brought the question of slaughter house reform to the fore and every point connected with it should be fully thought out and attended to. Hygiene is the first object of the abattoir; the second, however, is to provide the butcher with every facility for carrying on his trade. There must be an ample supply of good water and provision for purifying the waste water and freeing it from infectious germs. Every part should be built so that it can be easily disinfected, and it this way conduce to the stamping out of any infectious epidemic which may occur

The superintendent of an abattoir should invariably be a qualified veterinarian. In the first place it is necessary to have a vet erinary surgeon, armed with official au thority, in an abattoir, with whom rests the final decision as to whether meat is fit for human food or not, and again it is neces sary to have such an official in case an in fectious epidemic should break out. 1 veterinarian can easily master the working and management of an abattoir, while man who has merely a commercial train ing can never discharge the special dutie of a veterinary surgeon, so that one would have to be employed in any case.

I trust that what I have said will help to show the advantages of a public abat toir over a private system of slaughte

houses.



CONDITIONS AFFECTING THE EFFICIENCY OF SEWAGE DISPOSAL WORKS IN CANADA

By R. H. MURRAY, A.M. Inst. C.E., A.M. Can. Soc. C.E.

Read before the Third Congress Canadian Public Health Association, Regina.

THE term "Canadian Conditions," as applied to sewage disposal works, is usually considered to refer only to climatic conditions. While the severe winter of our northern latitudes necessitates certain provisions being made to render the operation of the several processes of treatment independent of climate, this is only one of the many conditions which are at present identified with the sewage problem in Canada.

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The Dominion is developing rapidly in an age when engineers, by reason of their specializing in sanitary work, are enabled to advise along the lines of the latest theory and practice in sewage treatment, but there are many circumstances arising from the rapid development of the country which militate against the construction of the works in accordance with the intention of the plans, and against the efficient supervision of the plant when completed.

Our limited seaboard, expansive lakes and extensive prairie provinces, present features which have a direct bearing on the question of sewage disposal, and the high freight rates to cities and towns far remote from the available source of supply, necessitates the consideration of possible substitutes for the accepted materials of construction.

There are therefore four factors which may materially affect the efficiency of sewage disposal works in Canada.

- (1) Climate.
- (2) The Comparative Youth of the Dominion.
 - (3) Physical conditions.
 - (4) Materials used in construction.

Climate.

With the exception of certain localities on the Pacific Coast, sewage disposal works in Canada must be roofed over in order that the latent heat of the sewage may be conserved to the fullest extent, and freez-

ing obviated. Roofs should be designed to enclose the minimum amount of air space, at the same time giving head room for accessibility and inspection. This precaution has proved sufficient in the East, but in our Western Prairie Provinces artificial heat is introduced in many of the plants. Western experience without the introduction of heat, shows that the liquid in the settling tanks will not freeze, but trouble may be expected where biological filtration follows sedimentation. In small installations, where it is possible to house both settling tank and filter bed under one roof, the danger of freezing is not so real. Distribution by means of trays or channels is almost sure to be affected by frost, owing to the large area and small depth of the sewage. The fact that sewage plants require to be roofed over detracts very considerably from the finished appearance of the works. Aesthetics have not yet received much consideration in the design of disposal works, but much could be done at little additional cost in laying out and maintaining the surrounding grounds, and in giving the design of the roofs a little more attention and thought.

The disposal of sludge is also affected by elimatic conditions, inasmuch as the sludge must be stored during the winter months. In the Prairie Provinces it is well to design the sludge chamber on the basis of four months' storage, and if a clarified effluent is desired from the tanks, the sludge should under no circumstances be permitted to accumulate in the settling tank, but should be allowed to gravitate from the latter into a separate chamber. In the summer months, precautions should be taken to exclude flies from the works, by providing screens for the windows and doors. Sludge beds, however, by reason of their being out of commission in the winter months, are not protected in this manner. It is not uncommon to see a bed on to which sludge has been recently discharged alive with flies. Removable screened coverings should be provided which would keep the beds immune from flies while the sludge is drying out.

The constructional irregularities evident in many of our public works are often the direct result of inefficient inspection. The importance of engaging qualified inspectors may be recognized, but it is usually impossible to secure experienced men. This is largely due to our limited constructional season. Practically all outdoor work is suspended for four months in the year, and the inspector's duties terminate with the close of the constructional work. The salaries paid to inspectors are, as a rule, lower than the wages earned by the tradesmen whose work they are required to su-There is, therefore, no encouragement for the experienced tradesman to take up inspection work. The solution of the difficulty seems to lie in the retaining of skilled tradesmen as inspectors, by our cities during the off season, their yearly salary being in excess of the amount they could earn at their particular trade during the constructional season.

If it were possible to give figures showing the money wasted every year through lack of proper inspection, our municipalities would realize that qualified inspectors are a necessity for the economic and efficient construction of public works.

Conditions Arising From the Comparative Youth of the Dominion.

There has been, and still is, an opinion prevalent amongst certain contractors that there is no need for any particular refinement in the construction of sewage works. This view cannot be replaced too soon by the knowledge that while certain irregularities might be permissible in say, the construction of a clear water reservoir, without impairing its efficiency, the utmost care and attention must be given to every detail in finishing a sewage disposal plant. Contractors should be encouraged to specialize in a certain class of engineering work, and this can be best accomplished by municipalities waiving the hard and fast rule, of accepting in nearly every case, the lowest tender.

The available number of skilled work-

men, is at present altogether insufficien for the yearly constructional programm but this condition will improve when the population of our cities is in more reason able proportion to the yearly expenditur It is significant that the qualifications superintendents of sewage disposal work in most of our cities are not those of me holding similar positions in Europe. Wi the advent of sewage disposal installation in scores of the larger cities in Englan there has arisen a demand for men w are qualified to supervise their operation A new profession or calling has been e tablished, that of sewage disposal wor superintendent. These qualified men ha become so numerous and interested their work as to form an "Association Managers of Sewage Disposal Works Municipalities have realized the necessi of engaging men who are qualified to ma regular analysis of the effluents from t tanks and filter beds; who understand t bacteriology of sewage disposal and a have sufficient engineering knowledge maintain and adjust the various mechacal appliances in modern installations.

There are only a few cities in Cana which have at present plants large enout to justify the engagement of an expebut through time there should be a landield in the Dominion for qualified sews disposal works managers. We employ my who have studied chemistry and bacteriogy to supervise our large water filtratiplants, and such men are equally necessation extensive sewage disposal installations.

Physical Conditions.

In Western Canada, where it is not usual to find cities whose only availa outlet for liquid waste is a small cre which is practically dry during summ and which is used by farmers for water stock and often for domestic purpos every known process which contributes the obtaining of a non-putrescible and n pathogenic effluent should be adopted. the other hand, there is often a tender to adopt refinements in the treatment sewage discharged into large rivers tidal estuaries, which, while rendering effluent a highly desirable one, is calcu ed to involve the city concerned in ne less expense.

There are certain physical features

culiar to our Western Provinces which have a bearing on the economic and working efficiency of disposal works. The prairie subsoil of clay is common to almost all our towns and cities and it will be found that the sewage on arriving at the works, contains only a small amount of mineral matter in suspension, compared to sewerage systems installed in a subsoil of sand or gravel.

The fact that the separate system of sewerage is so universally adopted in the West, also contributes to the lack of foreign substances in the sewage. In whatever localities these conditions prevail, detritus tanks can be dispensed with, the function of the latter tanks being to arrest the heavier mineral particles in the sewage, by reducing the velocity of the liquid sufficiently to precipitate them, without allowing the organic matters to settle.

To what extent the alkali present in our Western soil will disintegrate concrete structures, is a question deserving of careful consideration by engineers. Experience has shown that concrete pipes have disintegrated to such an extent from this cause as to collapse, and subsequently require replacing by vitrified pipe. The effect of alkaline soils on concrete is to cause the crumbling away of the surface in contact with the ground water, the deterioration taking place between high and low ground water levels, and as far into the body of the concrete as the moisture penetrates. The process of submersion, succeeded by drying out, produces an effect very similar in appearance to that of freez-The precautionary measures to be adopted, should be those which will assure greater density of the concrete and the coating of the surface with some form of impervious mixture. Trade wastes of an alkaline or acid nature, do not as yet form an important factor in the composition of the sewage of our Western cities, but the fact should not be lost sight of that the nature of the sewage will alter with the increase of manufacturing works, and conerete tanks and sewers will be subjected to attack and deterioration from both sides. *Materials of Construction*.

One of the most costly items in the construction of sewage disposal works, where the treatment includes biological filtration, is the filter media which usually consists of broken stone.

In the West it is impossible to obtain furnace clinker or slag at a cost less than stone, owing to the freight rates from points where clinker can be secured. An efficient substitute which may be advanced for crushed stone will be welcomed by engineers. The Saskatchewan clay has already been proved to harbor great utilitarian possibilities, and Dr. W. W. Andrews, of Regina, who is at present experimenting along these lines, is confident that a satisfactory filter medium can be produced from this clay when burned, and at a very low cost. The advantages claimed for the proposed filter medium, are that it is light (and consequently easily removed for cleaning purposes), that it contains iron in the ferric condition, which will tend to transfer oxygen to the filter bed and support the iron bacteria, and that it is well fissured. The essential quality of a filter medium is that it should weather well, and this can only be determined by actual test. Vitrified clay has been used for this purpose in the United States and Europe with varying success.

In conclusion a voice might be given here to the inconvenience and delay caused to engineers and municipalities due to the fact that there is no firm or agency in Canada who at present stock sludge valves, chain pumps and other small fittings in dispensible to sewage disposal works. There are scores of plants for private dwellings, institutions and villages, built every year, the entire fittings of which consist of a few valves, and these cannot be obtained in Canada, resulting in the works being completed and ready for operation, long before the fittings come to

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ECONOMICS OF SEWAGE DISPOSAL

By R. POTTER, B.Sc., A.M. Can. Soc. C.E.

Town Engineer, Battleford, Sask.

Read before the Third Congress Canadian Public Health Association, Regina.

RECENT contributor to one of our Engineering magazines, in defining sewage disposal, says: "The art of sewage disposal means the economic elimination or prevention of nuisances with respect to water-borne wastes." The writer would point out the imporance of the word "Economic" and the happy choice of the word "Art," rather than "Science," when the apparent state of knowledge with regard to sewage disposal is considered. In regard to the matter of the design of sewage disposal works, another writer has stated that "The tendency in Canada will probably be, and certainly is, to expend time and money on experimental work, in order to prove what has already been made axiomatic by the work of other countries." While this may be true with regard to certain methods of sewage disposal, the axioms at present apparent with regard to disposal by dilution are apparently very few. It is to the problems connected with this phase of the sewage disposal question that the writer wishes to draw attention.

In Canada, checkered as it is with rivers and lakes, disposal by dilution is in the large majority of cases a possibility wherever the choice of a system of disposal has to be made. Suppose that it is necessary to make such a choice for one of our many towns and cities situated on these rivers and lakes, what regulations are there to guide our choice, or what restrictions exist in regard thereto? In looking into the matter, we find that the only regulations that do exist are those of the various Provincial Bureaus of Public Health, advised, in some cases, by consulting engineers, while in others they are not. Under such circumstances, it is hardly reasonable to expect these Bureaus, with inefficient, and sometimes poorly equipped laboratories, and working singly, to assist very much in the determination of the best methods or standards of sewage treatment.

majority of cases the Provincial Bureau call for practically a perfect biologica system of sewage disposal before the sew age is allowed to enter a stream or lake claiming that the streams shall be kept un polluted, further, that the purified sewag shall also be disinfected. Thus we find i necessary in order to meet the require ments of at least all of our Western Board of Health, to design some system of pre liminary purification before disinfection Turning from Provincial to Federal re quirements, we find by the Belcourt Bil that it is proposed to make it unlawful t use the water of Canada for the disposa Again, w of sewage and other wastes. find the Government, through the Com mission of Conservation, adopting resolu tions opposing the pollution of the water ways of the Dominion by raw sewage an factory wastes, claiming same to be a mer ace to the public health by reason of th contamination of public water supplies, a indicated by the excessive mortality from typhoid fever alone. The enactment of such legislation as these bills and resolu tions suggest is to be regretted, provide no more consideration is given than he been given to this important question.

In a consideration of the situation, man questions naturally present themselve Why should such restrictions be proposed Cannot our streams and rivers be used a means of purification, provided seway is first disinfected? As a defence of the natural system of purification is hard necessary, even if time permitted, we sha not attempt one, but will briefly consid what would be the result of the adoptic of this method. As previously stated, t object of sewage treatment is the elimin tion or prevention of nuisances with To acco spect to water-borne wastes. plish this, it is first necessary by thorou decomposition to convert the organic me ter in the sewage to a stable condition, a secondly, by disinfection and sterilization to reduce to a minimum the number of careful study of the situation before rewater-borne disease germs. If, therefore, we disinfect the raw sewage and discharge it into a stream, where a possible dilution of one in ten is obtainable, what is the result? The sewage highly diluted by its water carriage is still further diluted by the stream, so that the resultant mixture is very little different from the diluting water itself. This is shown by the accompanying table from a recent publication, showing the comparison between a certain sample of diluting river water, and the diluted sewage, both raw and nitrified:

										Water.
Chlorine.	0								٠	3 to 10
Nitrates.					9					.43 to 4.95
Nitrites.										.0135 and less
Free Am										
Album A	n	nn	ne)1	i	a				.066 to .007

Thus we see that we have made our sewage chemically pure and have left practically unchanged the chemical composition of the stream. This diluted and disinfected sewage will be stable under most conditions obtaining in our rivers and lakes. By the disinfection and oxidization, we have reduced the bateria count to a minimum, and as putrefaction is not possible in such a media, where the oxygen supply is abundant, there exists little further possibility of pollution. One therefore asks, "Are the elaborate systems of purification necessary, when disinfection is all that is required?" The writer realizes that the point here raised is a debatable one, at the same time worthy of serious consideration, as great importance attaches itself to any conclusions that may be reached. In the time allotted, it would not be possible to enter upon any of the many arguments that may be advanced in support of this contention, far less to intelligently discuss the matter and arrive at any valuable conclusion. It is to be hoped, however, that this paper and the resulting discussion thereon, might result in some steps being taken toward the speedy formation of, say, a Canadian Sewage Commission, empowered to decide such points. It has also been pointed out that practically nothing has been done in Canada in the matter of sewage disposal. The importance, therefore, at this time of a

stricting legislation as enacted is readily apparent. The reasonableness of Federal control of all our streams, many of which are nearly transcontinental, is readily conceded. Towns in Manitoba should not be compelled to preserve unpolluted the stream passing by its door which has been polluted in Saskatchewan and Alberta. Similarly, Saskatchewan legislations are useless if Alberta does not protect this powers stream. Certain discretionary should be vested in the Provinces, but in the main, matters pertaining to stream

5	Sewage 1-1	0 Dilution	
	Sewage.	Nitrified	
6.5	to 11.5		
.01	and less	1.3 to 3	.0
.01	and less	.3	
3.91	to 1.0	.19 to	.01
.65	to .01	.01 an	d less

pollution, should come under the control of a competent Commission of Engineers making a constant study of the situation. Much literature exists dealing with the practicability and efficiency of the method of disposal by dilution. To anyone interested in this subject, the following articles will perhaps be found of value:

(1) "The Prevention of the Pollution of Canadian Surface Waters," by T. Aird Murray, M.Can. Soc. C.E.

(2) "The Proposed Disinfection of Sewage at New Bedford."-Engineer Record, Sept. 2nd, 1911.

(3) "Permissible Dilution of Sewage," by George W. Fuller, M. Am. Soc. C.E., Contract Record, July 30th, 1913.

(4) "Sewage Effluents and Putrescibility," by T. A. Dallyn, B.A.Se., published in Applied Science, March, 1911.

Besides the question as to whether sewage can be efficiently disposed of by dilution, there also arises the one of whether the choice, if permissible, is in the interests of economy. In this regard I wish to quote from two of the articles referred to above. These are probably the more interesting on account of the prominence of the authors and the more or less divergent opinions which are expressed therein. The first is from an article by Mr. T. Aird Murray, published in pamphlet form in 1912, by the Committee of Public Health of the Commission of Conservation.

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author of this article, after enunciating what he considers the standard method of sewage disposal, namely, the Biological system, states that the system is not designed for the removal of sewage bacteria, but only for the removal of those chemically organic attributes which create a nuisance by decomposition, and that if it is desired to render the sewage effluent fit to turn into a water used as a domestic supply, disinfection can be effected by a very small addition of hypochloride of lime. The article then continues as follows:

"It may be argued that if the object is to disinfect a sewage effluent and protect a water supply, then why trouble with the preliminary processes, especially when the sewage enters a large oxidizing body of water? Why not disinfect the raw sewage at once, or, in any case, disinfect the sewage liquor after the greater proportion

of the solids are removed?

"The answer is the great cost entailed and the difficulty of disinfecting a raw sewage with all the contained solids or even a sewage liquor minus the solid." To disinfect the solids in sewage by any known method would mean the employment of some mechanical method of breaking them into the finest particles possible, contact with the disinfecting media for days, and the use of probably about fifteen parts of chlorine to each 1,000,000 parts of sewage."

"To disinfect the liquor from sedimentation tanks after the grosser and greater proportion of the solids are removed and before the liquor has been oxidized also requires large quantities of chlorine, probably ten parts in 1,000,000 with compara-

tive long periods of contact."

"To disinfect the sewage effluent after the whole three processes above named, as we have seen, means only about two parts of chlorine in 1,000,000 of sewage.

"Now, in most cases, it will be found that the capitalized annual cost of the difference in the amounts of chlorine required will more than pay for the installation of the plant required for the preliminary or standard processes for the removal of the nuisance qualities.

"For example, suppose a city of 20,000 population produces 2,500,000 gallons of sewage per day. To disinfect the liquid

sewage after the solids have been part removed, at ten parts of chlorine p 1,000,000 parts of sewage, with chloride lime at one and one-half cts. per lbs. wou cost annually for the lime \$4,000. To d infect this sewage after it has been the oughly oxidized in filters and the rema ing solids removed, at two parts of chl ine per 1,000,000 would mean an anni cost of \$800 per annum. The differen in annual cost capitalized at five per ce would represent a capital sum of \$64.0 Filters for oxidizing sewage can genera be built at about \$30,000 an acre, at feet four inches in depth of crushed sto and will handle two and five-tenths n lion gallons an acre of sewage a day. Th is thus a capital saving of \$34,000 adopting disinfection as a final, rat than a preliminary process."

In view of the fact that Mr. Murray do not limit the application of his theory any particular set of conditions, but particularly stated that the Biologic treatment is necessary and economic even where possible to discharge the effect into a large oxidizing body of wathe following excerpt from a report for the Bureau of Public Health of the Gernment of the Province of Sasketchever

may appear interesting:

"It has constantly been my policy encourage in every possible way any tors in the design of sewage dispe works which will render the effluent ha less, and, as nearly as possible, pure. the same time, I have to bear in mind t although a high degree of purification necessary in some cases where the efflu is discharged into a small creek or stre the amount of treatment required, and consequent cost of construction, in of circumstances where the effluent can discharged, into a large volume of wa can be considerably restricted, and same protection afforded to the pu health.

"Modern practice in sedimentation sterilization of the effluent has made it sible to obtain highly efficient results we out resorting to biological filtration, ye vided that the effluent can be discharinto a river of such volume as the Na Saskatchewan River possesses at Ba

ford.'

The Commissioner therefore recomme

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the temporary ommission at least of biological filtration, but is desirous of efficient chlorination. If then, the former theory as to economy still holds good, is it not readily deduced that the recommendation, if carried out, would prove a matter of false economy to our towns and cities. However, in further considering this question of economy, the article in the Engineering Record, above referred to, will doubtless prove of value, and would seem to uphold the position of the Commissioner. In this article, the opinions of Prof. Earle B. Phelps, regarding the "Proposed Disinfection of Raw Sewage at New Bedford," are given, and it is interesting to note how opposite are his views to those of the author of the first article referred to. It is in part as follows:

"The amount of bleaching powder found necessary for the satisfactory disinfection of crude sewages ranges from 100 to 150 lb. per 1,000,000 gal. of sewage, depending largely upon the dilution of the sewage itself. When that amount of disinfectant is properly applied to a sewage and a sufficient time has elapsed for the action to have taken place, a reduction of from 95 to 98 per cent. of the bacteria present re-All available evidence indicates that the pathogenicity of a sewage or the danger to the public health is reduced by at least these same values. Bleaching powder costs at the present market from \$22 to \$26 per ton, depending somewhat upon the transportation charges. The addition of small quantities of lime, together with the bleach, has been shown to increase its efficiency and correspondingly reduce the cost. Actual experiment is still necessary to determine the exact quantities of both the bleach and the lime required in any given case since different sewages react differently under similar methods of treatment."

"In the actual operation of the process much depends upon the proper admixture of the disinfecting substance with the sewage. The treated sewage must then be held for a period of about 15 minutes for the completion of the disinfection. This storage should be obtained in a tank which will prevent sedimentation as far as possible."

"The amount of chemical required to produce the desired results depends to a

large extent upon the amount and condition of the oxidizable organic matter present. In general the stronger the sewage the more disinfectant required. Strength, however, in this case is measured not wholly by the amount of organic matter, but to a large extent by the readiness with which it is oxidized. In brief, the rapidity with which the bleach is used up by the organic matter of the sewage determines to a considerable extent the amount of bleach necessary to produce the required result. There would seem to be a distinct advantage, therefore, in some preliminary purification of the sewage, according to Professor Phelps. Experience has shown that where disinfection is the sole object to be attained the saving in the amount of chemical used which results from preliminary treatment is in general less than the cost of such treatment. This general rule applies equally to all degrees of purification, ranging from simple clarification or sedimentation, on the one hand, to that degree of oxidization which is represented by treatment on trickling filters, on the other. Owing to the rapidity of the disinfecting action and the comparative slowness with which the hypochorite attacks suspended organic matter—that is, organic matter which is not dissolved—the decreased cost of disinfection which follows any clarification process is quite slight, and not at all commensurate with the cost entailed in such clarification.

From these articles it is readily seen that there is a wide difference in the opinion of these two authors. One states that the cost of the necessary disinfection is \$6,000 per year, using 15 parts per 1,000,000; the other says \$1,500 is the cost. One states that a comparatively long period of contact is necessary; the other states that the treated sewage must be held for fifteen In the face of such divergent views, held by prominent engineers, how can our Bureaus of Public Health assume the responsibility of deciding that the proper procedure is to adopt or omit filtration previous to disinfection, where disposal by dilution is possible? When we consider the importance of the discussion from a financial standpoint, I believe you will agree with me that we have here a matter of sufficient importance to warrant investigation, in order that conclusions may possibly be reached that will be less at variance than those at present existing.

Allied to the question of economy in connection with the method of disposal by dilution, are other questions worthy of consideration. For instance, should communities be required to render the sewage bacteriologically pure? In this regard a quotation from a conclusion from the Royal Commission, is also of interest:

"The Royal Commission on Sewage Disposal of Great Britain has considered this question at length, and its conclusion was as follows: We are satisfied that rivers generally, those traversing agricultural as well as those draining manufacturing or urban areas, are necessarily exposed to other pollutions beside sewage, and it appears to us, therefore, that any authority taking water from such rivers for the purpose of water supply must be held to be aware of the risks to which the water is

exposed, and that it should be regarded a part of the duty of that authority, sy tematically and thoroughly, to purify the water before distributing it to their cutomers."

"Apart from the question of drinkin waters, we find no evidence to show that the mere presence of organisms of a nox ous character in a river constitutes a darger to public health or destroys the amenties of the river. Generally speakin therefore, we do not consider that in the present state of knowledge, we should highly justified in recommending that it should be the duty of a local authority to treat is sewage so that it should be bacteriologically pure."

In concluding, the writer hopes the other papers to be read in the Convention relation to sewage disposal, may eliminate some of the apparent difficulties are may assist in the arriving at more definition conclusions as to the economics of the arriving at more definitions.



RESULTS OF MECHANICAL GRAVITY FILTRA-TION AT SASKATOON, SASK.

By GEORGE B. CLARK, B.A., A.M. Can. Soc. C.E.

City Engineer, Saskatoon

Read before the Third Congress, Canadian Public Health Association, Regina.

WO years ago, at the annual Congress of this Association, held in the City of Montreal, I had the pleasure of presenting to the Engineers' Section a description of the mechanical gravity filtration plant at Saskatoon, then in course of construction, and before giving you some of the results obtained from the operation of it, I will briefly describe the plant as constructed.

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The City of Saskatoon obtains its water supply from the south branch of the Saskatchewan River. This river and its tributaries, are being polluted by the sewage from a number of towns and cities, including Calgary, McLeod, Lethbridge and Medicine Hat. In addition to being contaminated, the water of this river is very turbid at certain seasons of the year, and it is generally believed that a turbidity in the water such as is presented in this case, consisting to a large extent of fine quartz particles, predisposes to enteric conditions.

For these two reasons, therefore, namely periods of excessive turbidity and danger of contamination, the civic authorities decided that it was advisable to take the necessary steps to purify the water, and the writer was requested by the city to report on the subject of filtration. Before doing so, some filtration plants of different types were visited, including among others those at Albany, N.Y., Hackensack, N.Y., Harrisburg, Pa., Philidelphia, Pa., Columbus, Ohio, and the outstanding features of

each noted.

Requirements of Water Being Used for Domestic Purposes.

Water which is required for domestic purposes, should possess the following qualities:

1. It should be free from disease-pro-

ducing germs.

2. It should be free from those allied organic forms, which are not conducive to health, although they may not as yet be recognized as accompanying diseases.

3. It must be uniformly clear and free

from turbidity, whether it be produced by mineral or organic matter.

4. It must be free from color, odor and

The methods adopted by the City of Saskatoon to accomplish these results may be divided into three steps, viz.:

Sedimentation, Filtration and Steriliza-

tion.

Sedimentation.

The sedimentation basin has a capacity sufficient to give the water 8 hours subsidence, when the filter is working at full capacity, and is divided into two parts by a wire wall across the centre. In the north half of the basin, plain sedimentation takes place, and in the south half, sedimentation and coagulation. The coagulant used is sulphate of alumina, because the water has a sufficient alkalinity content, so that sulphate of alumina presents the necessary reaction to form an alumina hydrate, which, in precipitating, coagulates much of the organic matter, and drags down the finer suspended matter.

Provision has been made for applying

the coagulant at three points.

1. When the water enters the basin. 2. When it passes over the weir. Just before it enters the filters.

The solution of sulphate of alumina used is 350 lbs. to 1,980 I.G. of water or 1.8 per cent. solution.

Filtration.

The three best known types of filters were duly considered before a decision was arrived at, as to which one was best suited to our purpose. A very strong point in favor of the pressure filter was that with this type of installation, one system of pumps would have been all that was necessary to deliver the water from the river direct to the distributing system, whereas with either of the other systems a double pumping system is necessary. The excessive turbidity of the water, however, made preliminary sedimentation absolutely necessary, and the idea of installing pressure filters had therefore to be abandoned. The gravity mechanical filter was chosen over the slow sand type for the following reasons:

 The mechanical filter will handle 50 times more water per unit of area per day

than the slow sand filter.

The mechanical filter is on account of being much smaller in area much more easily protected from excessive cold.

3. The initial cost of construction is

about one half.

4. The cost of operating slow sand filters in the case of highly turbid waters is much in excess of mechanical filters.

Cleaning the surface of slow sand filters requires the dangerous personal contact of workmen.

Description of Plant.

The mechanical plant installed consists of the following:

1. One filtered water basin, capacity

125,000 imperial gallons.

- 2. Six concrete filter units, each with an effective filtering area of 290 sq. feet. The filtering material consists of an 8 in. layer of gravel, graded in sizes from .2 to .5 of one inch, the larger pebbles being placed on the bottom, and a 36 in. layer of sand graded from .36 of a millimeter to .55 of a millimeter, and consisting of hard silicious material free from vegetable matter or other foreign substance.
 - 3. A wash water pump and motor.

4. An air compressor.

- A complete apparatus for preparing and feeding sulphate of alumina and hypochlorite of lime.
- 6. Hydraulically operated valves for controlling the operations of the filter units.

Sterilization.

This is the third operation which is sometimes required to be performed in cases where harmful bacteria are still present in the filtered water. It consists in our case of the addition of hypochloride of lime in the form of a .5 per cent. solution, and is applied to the water at the point where it enters the filter beds.

The total amount of hypochloride used by us since the plant was first put in operation in June, 1912, was only 900 lbs.

With the assistance of the slides I shall now briefly describe the operation of the plant.

Results

Table I—Appended hereto is a typi monthly operating cost sheet. It will noted that the chief items of expense salaries of superintendent and operate and the charge for interest and sink fund. The cost for filtration for the most funds, 1913, per 1,000 imperial gloss, was 1.93 cents.

Table II.—Shows in detail the operation of the plant during the month of agust. The quantity of water pumped a filtered, the chemicals used, and the the bidity of the water is given for each distribution of sixty per cent. reduction of turbidity

accomplished by sedimentation.

Table III.—Illustrates clearly how amount of coagulant required, and amount of wash water used, vary direct as the turbidity. The amount of coal lant required varies from about one-quater to one and one-half grains per gall with an average for eight months of 34 a grain. While the amount of wash was required varies from two and one-half five per cent., with an average for eight months of 34 per cent.

Table IV.—Shows that although the perintendence and interest and sink fund remain constant, the turbidity is sufficient range to vary the cost of filing from a minimum of 1.4 cents per 1, I.G. to a maximum of 2.16 cents per 1, I.G., or an average for the eight mor

of 1.77 cents per 1,000 I.G.

It is of interest here to note that turbidity of the South Saskatcher River water varies from 30 parts per

lion to 3,750 p.p.m.

Table V.—Shows the bacterial reme efficiency for eight months. For six more the removal has been over 97 per cent. the month of February the removal only 80 per cent. but the bacterial count the raw water was very small. The recount in the raw water in March is counted for by the melting of the studing that month, and the consequent positing in the river of the filth collection the snow during the winter months, also by the increased volume of water derneath the ice scouring the river bott

A study of these records shows that plant has, in respect to wash water req ed and bacterial removal fulfilled the g antee given by the Roberts Filter Ma facturing Company, who installed it.

TABLE I.

Monthly expense report for the month of August, 1913:

Filtration Plant.	
Salaries of operators and superintendent	\$315.00
Bacteriologist	59.33
Additional labor, none	00.00
Alum, 4,550 lbs., at \$2.25 per cwt	102.37
Hypochloride, 240 lbs., at \$2.74 per cwt.	6.58
Wash water, 1,922,000 gallons, at 6c. per 1,000 gals	115.32
Stores, none	110.02
Power, 1,077 K.W.H. at 6c. per K.W.H	64.62
Light, 235 K.W.H. at 6c. per K.W.H	14.10
Heat, none.	
Repairs, none.	
Laboratory, fixed charge of	25.00
Interest and sinking fund	400.00
m + 1 - + 6 + 1	\$1,101.32
Total cost for month	\$1,101.52
Water filtered for month, 57,283,000 gals.	
Cost of filtering per 100,000 gals	\$1.93

TABLE II.

Summary of Water Filtered and Chemical Distribution for Month August.

	Venturi	Wash-	Alum Used	Alum	Chloride	Chlorid		rbid-	Turk	idity
Aug.	gallons per		Grains		Grains per	Grains		ty	treat	
_	day.	per day.	per day.	per gal.	day.	per gal		aw.	100	
1	2,043,000	72,000	1,208,644	0.57	123,600	0.058	130	ppm	100	
	2,027,000	72,000	938,304	0.45	185,380	0.089	130	66	100	4.6
3	1,468,000	72,000	982,584	0.64	77,250	0.05	130	66	100	66
4	2,082,000	72,000	1,009,152	0.45	47,628	0.06	110	66	65	4.6
5	2,081,000	72,000	1,009,152	0.45	126,908	0.059	120	66	65	66
6	1,856,000	72,000	912,744	0.47	63,504	0.060	120	44	100	66
7	1,827,000	72,000	623,520	0.33	0	0	100	6.6	90	66
8	1,772,000	72,000	752,084	0.41	0	0	100	66	90	66
9	1,643,000	72,000	623,520	0.36	0	0	100	66	85	66
10	1,464,000		623,520	0.43	0	0	75	6.4	55	6.6
11	1,706,000	72,000	703,860	0.4	0	0	75	6.6	55	66
12	1,737,000	60,000	623,520	0.35	0	0	75	4.4	55	66
	1,817,000	60,000	691,584	0.35	0	0	95	6.6	75	6.6
14	1,688,000	60,000	665,860	0.38	0 .	0	75	6.6	55	66
	1,748,000	60,000	666,060	0.36	0	0	65	6.6	50	66
	1,793,000	60,000	666,060	0.36	0	0	65	66	45	44
17	1,487,000		623,520	0.40	0	0	65	4.4	45	6.6
18	1,750,000	60,000	623,520	0.34	0	0	80	4.4	55	6.6
19	1,660,000	60,000	768,132	0.45	0	0	130	4.6	80	6.6
20	1,842,000	60,000	1,328,863	0.7	0	0	180	4.4	70	6.6
21	1,701,000	60,000	1,238,823	0.7	74,088	0.07	150	66	45	6.6
	1,869,000	60,000	1,210,008	0.63	127,008	0.066	180	6.6	45	6.6
23	1,893,000	50,000	1,210,008	0.62	127,008	0.065	250	66	65	6.6
	1,559,000	60,000	1,067,728	0.66	127,008	0.078	200	6.6	70	66
25	1,937,000	60,000	1,158,203	0.58	68,790	0.06	180	66	70	66 .
26 :	1,917,000	72,000	1,702,913	0.8	108,528	0.09	250	66	70	66
27	1,920,000	72,000	1,953,542	0.98	186,048	0.093	350	66	65	6 6
28	4 050 000	72,000	1,869,999	0.96	186,048	0.096	400	66	45	6.6
	1,910,000	72,000	1,524,839	0.76	54,264	0.094	300	66	30	66
-0	2,010,000	12,000	2,022,000	0.10	01,201	J.VUI	300		00	

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	Aug. 30 31	day.	water gals. per day. 72,000	TABLE Alum Used Grains per day. 1,438,727 1,451,200	Alum	Chloride Grains per	per gal.	raw.	Curbidity treated. 35 ''
		55,361,000	1,922,000 3	31,870,204	0.556	1,683,060	0.063		
	Po Po An	ash-water otal water ounds of su ounds of his verage turk verage turk	ed to city in used, 1,922 filtered, 57 alphate of ypochlorite bidity of residual to the control of the control	2,000 gallo 7,283,000 g alumina, of lime u aw water, reated wa	ons. gallons. 4,552.8. sed, 240 167 pp ter, 67). m. ppm.	60		
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May, 1913	. 4,172.0	37.0	96.7
June, 1913	. 2,553.0	28.0	99.0
July, 1913	. 7,358.0	21.0	99.7
August, 1913		42.0	98.1

THE NON-IDENTITY OF MODERN LEPROSY AND BIBLICAL LEPROSY

By H. W. HILL, M.B., M.D., D.P.H.

Director Institute of Public Health, London, Ont.

Read before the 3rd Congress Canadian Public Health Association, Regina.

THE only excuse for presenting this very old subject now is the continuance even in these days of the mistreatment of sufferers from modern leprosy (lepra), due as I believe, largely to unreasoning traditional fears, to the terrible word-pictures which the clergy draw of Biblical leprosy (tsaraath), and to the popular identification of lepra and tsaraath, so widespread in all Christian lands. If it can be conclusively shown that lepra and tsaraath are names for two very different diseases, it may be possible to overcome the panic-stricken and cowardly cruelty so often visited on lepra cases.

The problem of comparing the two diseases is not so difficult as might as first appear. It is true that we must compare a written account, penned thousands of years ago, with an actual disease now existing in numerous patients. But the written account in question (Leviticus 13) has been translated with the greatest care from the most studied of all ancient literature. It does not consist of mere literary or poetic references on the one hand, nor of the crabbed technicalities of long-dead old time physicians on the other. It was written by or under the supervision of the most highly gifted and best educated man of his day; but it was written in simple everyday language, avowedly intended as a diagnostic guide for the priests. It is not and does not pretend to be a complete description prepared for medical students or physicians, intended to make them familiar with every stage and symptom; it confines itself simply to supplying the data the priests needed in deciding a crucial question; a momentous and solemn question to the individual whom they examined. A mistake in diagnosis might cut him off unnecessarily from his family, friends and the community, condemning him to outer darkness and loneliness, misery of every kind. Hence the minuteness and care, the repetitions and emphasis of the description, hence also the confinement of the description to the simplest of terms.

Taking these diagnostic signs, studying and checking them up we find two almost constantly reiterated. Whatever the minor variations noted for varying types these two requirements were usually essential for the recognition of tsaraath, their absence excluded it absolutely. If the lesion in question was under the skin, or if it enlarged noticeably in a week or at most two weeks, the patient had tsaraath.

If the lesion was not under the skin, or being in it, failed to enlarge much in a week, or at most two weeks, the patient did not have tsaraath; (although, if it spread later, it might be tsaraath).

Is there need to go further? However much or however little we may know about lepra, we all know that its skin lesions are in, not under the skin; we all know that these skin lesions enlarge very slowly; we all know that to demand for a diagnosis of lepra, that the lesions should be subcutaneous, or should spread rapidly would be to prevent the recognition of practically every case at every stage; and would compel the diagnosis of lepra in cases entirely free from it. In brief, if a physician, following the Mosaic handbook, should attempt to pick out modern lepers from a crowd of miscellaneous patients, he would infallibly miss every leper and might easily identify as

leprosy some of the innocent cases. Tsaraath and lepra are not only different—on the crucial diagnostic points, tsaraath is the converse of lepra.

How then has arisen the widespread belief in their identiy? First, perhaps, by reading into the text the ideas of contemporary historians and commentators all down the ages-ideas based, not on the text, but on what these commentators and historians thought about what was in it, but particularly about what was not in it; about what they thought ought to be in it, which Moses unfortunately left out. Second, from pure confusion of mind with regard to the identity of very many diseases. Remember that when the Hebrew text was first translated, indeed for very long after that period, not only lepra itself was only partially known, but syphilis was yet to be worked out; tuberculosis as an entity was not even suspected; cancer itself was in chaos; typhus fever and typhoid have only been disentangled within 100 years; chickenpox and smallplox were taught even by Unna as identical. The translators found in the Hebrew text a terrible disease described: they had heard lepra (or leprosy) spoken of with horror and loathing; perhaps they had seen it, shuddered and hastened away. They had no great reverence for the literal identification of one loathsome disease with another. They wanted to bring out the spiritual lesson, not the material. To translate the name "tsaraath" as "plague" or to transfer its name directly into the English text would take from it all significance to the average mind. Why not translate it as leprosy, a disease people already knew and feared; a quite probable disease too, for was it not exactly in Palestine that leprosy flourished?

Modern medical writers, usually slip out of the question by assuming that Moses adopted the folk-lore or old wives fables that he found existing, and lumped under tsaraath either from carelessness or ignorance, a wide range of commonplace skin diseases, some of which they identify as psoriasis, vitiligo, syphilis, scabies, etc.

This assumption does Moses little justice, and is not at all in keeping with the care and the foresight he showed in his writings in general; moreover, the iden-

tifications of the psoriasis, etc., are made by these writers on single symptoms wrenched from their context; a long distance snap diagnosis that would put to shame a correspondence school doctor!

I do not pretend to identify tsaraath with any disease; the diagnostic points given are not sufficient to recognize what it was; but they are wholly sufficient to recognize what it was not—and this list includes psoriasis, vitiligo, syphilis, scabies, for none of these show subcutaneous lesions, or necessarily enlarge definitely within one week or two.

There is, however, no object in speculating on its identity with any modern disease. There are two points in which tsaraath as described by Moses, differs essentially from any disease known now; these are its ability to develop in clothing and its ability to develop in the walls of houses. If these are dismissed as mere errors of observation, then we may as well dismiss the whole subject, for errors so great once admitted would assign the whole thing to the waste basket. If we suppose that Moses knew what he was writing about, we must give due regard to these statements; and we have no right to assume that tsaraath could not have presented these features simply because no modern disease is known to do so. Suppose that a parastic mould or sporothrix saprophytic existed, which has since died out, at once the whole account become lucid and connected.

However, this may be, there are two other points upon which tsaraath and lepra are often supposed to agree. The first is that both were extremely contagi ous; the second, that both were incur able. At this point the psychic and logi cal muddle becomes so complicated tha it is difficult to untangle the threads. It the first place, if tsaraath were extremely infectious, as assumed, it differed ex tremely from lepra, which as we know it is less than one-tenth as infectious as cor sumption. But the intense infectiousnes of tsaraath is pure assumption. It is tru that on its discovery in a person, that per son was pronounced unclean, and like a the unclean, was cut off from communication tion with the public. This has been as sumed a public health measure—the is lation of a contagious disease. But nowhere is any instance quoted from cover to cover of even a single case caught from a preceding disease. Never from cover to cover is the tsaraath case spoken of as a physical menace to others. No precautions were prescribed for the priests in handling or examining tsaraath patients, tsaraath clothing, or tsaraath houses; nor were any precautions prescribed for the workmen who were to scrape the disease from the stones or pull the infected house down. Then why was the tsaraath infected patient's clothing or house called "unclean"? I do not know. Why was a daughter in whose face her father spat called unclean; was it because she was a grave public health danger to others? Why was a recent mother "unclean" and still more why was she unclean twice as long if the baby were a girl as she was if the baby were a boy; was it for fear of infection to others? If "uncleanness" was intended as a public health measure, why were not syphilis, measles, tuberculosis, cancer and smallpox made unclean also, for undoubtedly all these diseases flourished then as now. In all but this one of the many, many circumstances under which a person was pronounced "unclean" by the Mosaic law, we frankly are in ignorance of its significance. Why should we assume that its significance in the case of tsaraath was so different, so evident, so modern?

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With regard to the alleged incurability of tsaraath helping to identify it with lepra, we may dispute the incurability of lepra with some success. But it is still simpler to show that tsaraath was not incurable, else why was an elaborate ceremonial provided for the cured man or woman to perform? Leaving out of account the alleged miraculous cures, we have several implications that cases became cured spontaneously; indeed the diagnostic handbook in Leviticus points out how to recognize a cured case.

Summary.

Lepra, the modern leprosy, shows its skin lesions in, not under, the skin; en-

larging slowly if at all; the enlargement in most cases being far too slow to notice in a week, or even in two. Tsaraath, the Biblical leprosy, showed its lesions, under, not in the skin; if the lesions were in the skin, but failed to enlarge noticeably within a week, or at most in two weeks, the suspect was released. The two diseases are therefore converse as regards these, the essential points of diagnosis of tsaraath.

The infectiousness and incurability of tsaraath, supposed to aid its identification with lepra, are nowhere mentioned or implied in the Hebrew accounts. This ancient belief in the identity of the two diseases has undoubtedly added much to the sufferings of the modern leper and should be dispelled as soon and emphatically as possible. Modern leprosy should never be called by that name, but always designated as lepra, and every effort should be made to point out that it is produced by a well-known germ, belonging to the tuberculosis group; and is in clinical effect a second cousin so to speak, to tuberculosis, but much less infectious—a disease to be supervised and prevented from spreading of course, but calling for no paniestricken flights from its neighborhood and no especial hardships or cruelty to its unfortunate victims.

I wish to acknowledge the kindly help, criticisms and suggestions in preparing this paper of two Hebrew scholars, Rev. Dr. Waller, principal of Huron College, Western University, London, Ontario, and the Rabbi, Lecturer on Hebrew, University of Minnesota, Minneapolis, Minn. On the clinical side, my own limited acquaintance with the disease in Massachusetts and Minnesota has been kindly supplemented by the greater experience of Dr. H. H. Bracken, Secretary of the Minnensota State Board of Health, who has long interested himself in the lepers of the United States; and of Dr. A. J. Chesley, director of the Division of Epidemiology of the same Board, who has seen the disease in the Philippines, as well as in Minnesota.

PRESIDENT'S ADDRESS

Canadian Association for the Prevention of Tuberculosis, Halifax, Nova Scotia

By SIR ADAM BECK

THEN I accepted the most honorable position as president of this very important association, I did so with much reluctance. As you may know, a considerable number of public duties have fallen to my lot, all of which are a source of more or less anxiety to myself. I have always endeavored that any responsibility I might assume of a public character would be fulfilled satisfactorily to my own conscience, and still more so to those who entrusted me with it. I have felt that during the past two years I have not given the time and attention that this office commands. My whole heart is in the work, however, not only because of my individual inclinations, but the inclination of the people of the City of London, from which I come. I think that this work is one of the noblest that men and women can be engaged in, and just here I should like to say how fortunate we have been in our governors in this particular.

The association was begun under the influence of Lord Minto, and our present honorary president, Field Marshal His Royal Highness the Duke of Connaught, has taken a great interest in this movement ever since his presence here in Canada. Last year we were indebted to him for an address at our annual convention in Ottawa, and his continued hearty interest and enthusiasm for the cause of the less fortunate ones in our midst is a help and. I am sure, an inspiration to all working in this great cause.

Owing to the great distances to be covered in Canada, the attendance at our annual conventions, while increasing every year, gives but a slight idea of the general interest in this Dominion-wide movement towards the prevention of tuberculosis. I am sure we are delighted,

however, to welcome such a large and representative audience as is gathered here to-day.

We are delighted to meet here in Halifax where so much earnest endeavor has been made towards providing for the tuberculous. Nova Scotia has the honor of being the first Province to provide accommodation for the tuberculous at Government expense, and this Province, I am glad to say, is striving for further legislation towards the prevention of tuberculosis (no worse, let us hope, for being somewhat along the lines of those of my own Province of Ontario). Being an Ontario man, I am naturally more familiar with the work of that Province, and, as president of the London Health Association, more particularly acquainted with the work of my own locality.

As we have come to look upon this work as more or less a local work, multiplied, of course, indefinitely, I might here tell something of that work in my own county:

 Queen Alexandra Sanatorium.
 Pavilion for the advanced cases at General Hospital.

Social work of the London Health Association.

Those working in this great movement could not fail to observe the need for more attention to the children, and the more deeply the question was studied the more the social conditions surrounding the tuberculous were examined and the environment of their children became known, the more pressing did the need of these children appear. Some of the most promising fruits of the general campaign against tuberculosis are the Preventoria and open air schools, and so we began this year our preventorium, which has just been opened.

On secretary's report will show the progress of the campaign elsewhere, but I might point out that in Ontario 1781 patients were cared for in nine different sanatoria during the past year. \$73,058.75 was spent for maintenance as against \$60,768 in 1912.

It is highly encouraging to note that death rate from tuberculosis is year by year growing less. As the Report of Hospitals and Charities puts it, "This splendid result must be ascribed to the efforts made by the Provincial Board of Health, through the efficient district officers, to bring its exhibit, with its strikeducational features, before people, to the introduction of suitable text books in our schools, as well as the dissemination of suitable literature, to the work of the local sanatoria and their dispensaries and district nurses, and to the fact that the people of Ontario are more than ever appreciating the fact that healthy homes and pure air are the great necessities to rid this country of the disease."

This, ladies and gentlemen, shows the work in only one of our Provinces, and I am proud to say that during the past year more substantial progress has been made throughout the Dominion, practically every Province being included, than during any previous year in the history of this great movement in Canada.

I am delighted to see that the Federal Government has made such a definite and advanced move against tuberculosis as the passing of regulations for the eradication of bovine tuberculosis.

At the annual convention of the Canadian Association for the Prevention of Tuberculosis held in London, Ont., Dr. Schroeder, of the Bureau of Animal In-

Washington, D.C., and others dustry, pointed out the dangers from bovine tuberculosis. Even the man in the street knows that impure milk, milk from cattle suffering from tuberculosis, is dangerous to a child. Our work among the children at the dispensaries and preventoria show that more children are suffering from this disease than we formerly believed. A proportion of these, according to the findings of the British Commission, as well as many other commissions, are certainly to be traced to infected milk, and, as president of this association which spends all its efforts in preaching prevention, I heartily congratulate those responsible for this great move for a pure milk supply.

Doubtless many difficulties will arrive in the carrying out of this measure, but with the co-operation of "well-trained physicians, a sympathetic Government, and, an intelligent people" surely we may look for a greatly lessened death rate from this most impoverishing and wide-spread disease.

The health of the community should be of interest to every individual, for upon it depends the welfare of himself, of his family, and of his fellow-citizens. Upon the health of the people depends the happiness and prosperity of the community. Without health there can be no real prosperity, and such material success as may be attained is of little benefit.

I therefore congratulate all the members of this association on the splendid work which they have been doing in the past, and trust that their labors may be rewarded by the saving of many lives, by the advancement in our social standards, and by the betterment of the general health and welfare of our own Canadian people.



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THE LEGAL ASPECT OF SANITARY INSPECTORS' WORK

By THOS. WATSON, A.R.S.I.

Chief Provincial Sanitary Inspector of Saskatchewan

Read before the Third Congress Canadian Public Health Association, Regina.

It is with considerable temerity that we venture to deal with this subject, because there is no class of professional men more to be feared than those of the legal fraternity. Yet, why should we fear? The title or text may appear alarming, but we venture to assure any such, if present, that the context in no way infringes on the talents or rights of those whose practice is that of law; quite the reverse.

Almost every step of a sanitary inspector's actions is subject not only to the criticisms of the ordinary layman, be he the man on the street, or his wife, or the more important gentlemen who form the boards under whose authority his duties are carried out. Those in the profession know also, that on any occasion when the decision of the court is required, he must be prepared to withstand the acumen not only of the presiding magistrate, but the keen, sharp-pointed cross-examination of the defending legal counsel.

Every act, and even every omission to act, is the subject of censure by some one who imagines he is being treated wrongfully. There is perhaps no public official whose work and duty is less understood or appreciated than the sanitary inspector, and no other public servant whose work is so completely restrained by legal enactments. This is well known to the general public, and yet how often do individuals and corporations become obstinate or perverse in complying with his lawful requests. Even members of health boards, for want of knowledge of his status and authority, frequently interfere with his usefulness.

In treating this subject we desire to do so from the standpoint of the existing examining bodies whose diplomas or certifi-

cates granted to inspectors are accepted and recognized by the British and British Colonial Governments, and because the public health law in this land is based or founded on that of the motherland.

It will be useful for our purpose to refer briefly to the origin and institution of the office of sanitary inspector. However interesting an historical review of the profession might be, time forbids such, but we may notice that as early as the reign of Richard II. we find statutes dealing with nuisances, and in the reign of Queen Elizabeth efforts were made to suppress unsanitary conditions by legal enforcements. During this Queen's reign also, an act was passed which sanitary authorities at this present time would be pleased if they could enforce in Canada. It dealt with overcrowding and was as follows:

"No owner or occupier of any cottage shall place or willingly suffer any more families than one to cohabit therein, in pain to forfeit to the Lord of the Leet 10 shillings for every month he so continues them together."

Coming to the middle of the last century, and during the early years of the reign of the late Queen Victoria, in 1847, an act was passed for the improvement of towns, which provided for the appointment of inspectors of nuisances.

In 1848 the first Public Health Act was passed, and this also required the appointment of inspectors of nuisances. Following hard on this Act many other measures of a similar nature were enacted, all bearing on some phase of work having as their object the amelioration of conditions for the betterment of the public well-being. Soon the amendments found necessary to the various acts became so confusing, that in 1875 a consolidation was necessary and

then evolved the Public Health Act 1875, the act which with some later amendments is still the law of England and Wales. It is under the provisions of this comprehensive statute and the General Orders of the Local Government Board of Great Britain that candidates for certificates in sanitary knowledge are examined, and from which they obtain their legal status or authority as inspectors. Legally their designation is that of Inspectors of Nuisances. We, in this country, are not to quarrel as to what we shall be called, but it is generally admitted that Sanitary Inspector is the more appropriate term.

In Great Britain and Ireland appointments are made subject to the regulations of the Local Government Board, and it is from those regulation that inspectors, sanitary authorities and all others whom it may concern learn of the duties sanitary inspectors are called upon to perform.

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Of the differences between inspectors of urban and those of rural districts, we cannot treat in this paper; suffice it to say that appointments made by either authority must be with the concurrence and approval of the Local Government Board, which is the supreme health authority in the land.

This ensures a certain tenure of office so long as the mental and physical abilities of the official fit him to satisfactorily discharge his duties. In Scotland the duties are somewhat similar, and are exercised under General Orders made under the Scotch Act by the Board of Supervision. The departments of the Medical Officer of Health and Inspector are much more distinct, and both officials have fixity of tenure.

This in brief is the origin and institution of the office of sanitary inspector, and he derives his powers from three sources, viz.: the Public Health Act, 1875, and amendments thereto; the General Orders of the Local Government Board, 1880, and the by-laws of his own Local Board.

So far as we know the Public Health Act of the Province of Ontario is the only one in Canada to specifically designate duties belonging specially to the sanitary inspector.

In Section 114, Schedule B of this Act there is a clear pointing out of what are the duties of the sanitary inspector, and

besides performing these he is also enjoined to assist the medical health officer.

the various Provinces are Although bound together by the Act of Confederation, each has its own health law, with the that there is no uniformity There is no either in law or practise. Anticipating as we do the time head . when the fruition of the labors of the Commission of Conservation will culminate in the creation of a supreme central health authority in this Dominion, we look with interested expectancy to having our status recognized in a manner equivalent to that of the Local Government Board of Great Britain.

We recognize that the Medical Health Officer is the chief health official, and that our duty is to assist him in certain work, but we also realize that we have a status to maintain. This can be and is being done without det racting in any way from the dignity of medical officers.

In public health work there are branches or divisions, more immediately pertaining to each office, and without being too hypercritical these might be defined as Sanitary and Medical. This is admitted in the definition of the duties to which reference has been made.

From this short account we learn then that the sanitary inspector's office is a legal one, that it was created by law. It is indeed the first recognition by Government that inspection is necessary in the interest of public health. All this is evidence in proof that this official has a separate existence as a legal health officer, indeed his was the first created, and therefore the oldest office in public health service. Think of it, gentlemen, and live up to the dignity, importance and responsibility of your calling.

Coming now to the subject matter proper, we must be careful not to confuse the powers of sanitary inspector with those of the local authority, because although many of the powers conferred on local authorities or health boards are in a manner delegated to the inspectors, the local authority is the responsible body, and is not relieved in any way from the onus resting upon them by such delegation.

This devolution of power to the sanitary inspector, although not strictly legal, adds very much to the effectiveness with which he is able to carry out his duties, because, being thus empowered he is able to act with promptitude in many cases where delay is not only unnecessary, but often dangerous. To one exercising the virtues of tact and judgment it impresses a greater sense of responsibility and creates a greater incentive to act within strictly legal bounds. It simplifies his work, relieves his board of much paltry detail, and the result is usually beneficial to all concerned.

However amusing and even humorous it might be to look at and numerate the many calls upon this official of matters that he is supposed to prevent, abate or cure, we must forbear. It will be in order to specify some of the more important legal duties and powers assigned him and to show by legislative enactments how the office is subject to a restraint which shall not be insufferable to the hereditary rights of citizens, and yet such as shall protect individuals from the unscrupulous and careless indifference of others in matters affecting the general health.

We will first notice the "power of entry" and how essential is this authority to the proper fulfilment of an inspector's work. He cannot from a distance ascertain conditions existing in any premises without minute and careful examination, so that this right of access is a sine qua non. The power of entry and the time during which it may be exercised is very rightly stipulated for the different legitimate duties where inspection is necessary. For instance, in the ordinary course of his work of periodic or systematic inspection, or on enquiry into complaints made, the right of access is during the ordinary working hours, usually from 9 a.m. to 6 p.m. This has reference to nuisances. house to house inspection for prevention of waste of water, dairy inspection and regular inspection of his district for insanitary conditions. For inspection of food, meat and slaughter houses the time is at any reasonable hour.

To enforce orders during epidemics or for enquiry into suspicious infectious cases at any time. To inspect registered common lodging houses at any hour. Smoke nuisances or those arising from offensive trades at any time when work or business is being carried on. With regard to pol-

lution of streams and the forbidden fouling of sewers by chemical refuse there is no time fixed.

These are the principal occasions when power of entry is provided for, and it is only rarely that the right is questioned. It is amazing what an amount of ignorance exists respecting the powers of health officers, whose usefulness would be negatived if this power to enter had not legal sanction. This brings us to the subject of obstruction. Although obstruction is seldom resorted to, occasions do arise when the inspector is refused admittance, or is interfered with in the exercise of his He then has the right to call to his aid officers of the law to enforce entrance for the purpose of fulfilling his object of inspection or enquiry. Penalties are provided for such as obstruct or deforce an inspector, showing that the law recognizes the importance of his work.

The conferring of the power of entry is proof that sanitary inspectors have certain legal duties to perform, and that they are responsible for the proper control of many subjects which relate to the health of the inhabitants within their district. To mention all items coming immediately under their supervision will be unnecessary, but several cannot be overlooked. In addition to the many things over which he is the custodian on behalf of the public's health, he must have a good knowledge of sanitary law and be conversant with local

by-laws. Lawful complaints and lawful instructions he must attend to, but oftentimes he is given instructions which he cannot legally obey. His knowledge of sanitary law must enable him to distinguish what legally belongs to or comes under his jurisdiction so as to guard him from illegal interference with matters and rights without his province. In most sanitary journals we find space devoted to a digest of law cases, the decisions on which sometimes affect both previous modes of procedure and practise, and it is necessary that inspectors keep advised of such judgments as may create new precedents.

We can only briefly refer to some matters to which the established rule of action applies, and with which rules the inspector must be familiar. Among the more important are the statutory definitions as to what is a house, building, street, sewer, drain, owner, occupier, tenant and many others; he must be able to draw the line between contagious and infectious; and have the faculty of discerning with judgment many matters having a legal bearing on every day duties.

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For the many enactments required by both statute law and local by-laws, he must be ready with answers to illiterate and passionate enquiries. In his reports to his board, especially when recommending new by-laws to cope with new conditions; when asking permission to undertake new systems of organization; or in suggesting works to aid or improve sanitary conditions he must be prepared with logical arguments that will be convincing to show the necessity for such changes.

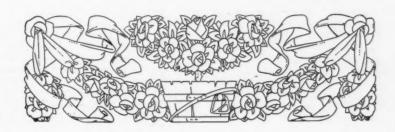
In the various health acts in our Dominion there is unanimity in placing under the control and jurisdiction of Health Boards all that properly belongs to sanitary and health matters, yet in spite of this there is a tendency among municipal rulers to filch or take away certain fundamental elementary branches of work, notably plumbing and cleansing or scavenging. If such branches as we have mentioned do not belong to the sanitary or health department then we know not what does.

It must be ours to guard against this danger, and to persist in holding our legitimate and proper business. In our preparatory training we are warned against encroaching upon the duties or work of other departments, especially that of the engineer, and yet this is the official upon whom is thrown such duties as are wrongfully transferred in many instances.

In closing we realize and value at its real worth the recognition we have received from such a body as the Canadian Public Health Association. This is evidence we have work to do in public service, and is also an assurance that our profession has the sympathy, approval and support of its members. As a section of the association we can show ourselves worthy, by collective and individual action in our various spheres, by earnest attention to our duties, whether in office or field.

The fact that we are now associated in a body will give force to any representations we may from time to time advance to the proper authorities for legal statutory standing of our profession.

When Councils, both Governmental and municipal, come to appreciate that there are a body of men qualified for the work of sanitary inspection, we may hope to have offices filled by competent officials.



THE ENGINEER AND SOCIAL SERVICE

By STEPHEN PARRY, B.Sc.

Professor of Mathematics, Regina College

Read before the Third Congress, Canadian Public Health Association, Regina.

N looking over the list of papers to be read before this Section, I notice that they all deal with technical matters which bear directly upon the health of the individual. It is perhaps because such matters do touch so directly upon the welfare of each one that they receive the amount of attention which is given to them. Each is every day reminded that his good depends fundamentally upon such things as efficient sanitation and pure water supply, and consequently his interest in such matters does not need to be quickened or his consciousness of their value stimulated. Such benefits, however, do not by any means exhaust the debt which civilization owes to the engineer. To a large extent we lose consciousness of those benefits which are gifts and not merely preventitives of evil, because possible danger does not force them upon our attention, and familiarity results in an unconsciousness which for all practical purposes is equivalent to ignorance. The fact that secondary causes intervene between so many of its benefits and the machine, which is the real giver, only serves to intensify this ignorance or unconsciousness. When, however, we direct our minds to the study of almost every one of the common things of life which we have begun to look upon as necessities, whether it be what we eat, drink or wear, whatever serves for our protection or ministers to our pleasure, is found to be made possible only by the advances of engineering skill. Recalling then the benefits which machinery has conferred upon us, it is perhaps a little surprising to find that the machine has not always been regarded as the blessing which at first sight its fruit would have led us to expect. From its earliest stages it has been a thing of suspicion to the worker and the cause of more industrial unrest than anything else of which we know.

Much of his opposition was doubtless due to ignorance. It is certain that all his attention was directed to the immediate and problematic future ills caused by its introduction, but it would perhaps be untrue to say that his suspicions were altogether illfounded. Others, who cannot be accused of ignorance, speak with no uncertain voice of the evils which machinery introduced. Emmerson writes: "The robust rural Saxon degenerates in the mills. The incessant repetition of the same hand work dwarfs the man, robs him of his strength, wit and versatility to make a pin polisher, a buckle maker or any other speciality." John Stuart Mill, in dealing with this question uses words to the effect that the introduction of machinery has not lightened the toil of any son of man. Such evidence as this causes one to wonder whether upon examination, as well as being the cause of so many benefits, the machine may not also be responsible, fundamentally, for many of our ills. The results of our own thinking, of our own experience, and the written evidence, upon which we are easily able to draw, will without doubt confirm the suspicion. It is for this reason that I venture to interpolate this nontechnical paper among those to be read before this audience of engineers. Any inquiry which leads to such a conclusion as the above, must of necessity be of interest to the engineer, and the fact that he is an engineer does not therefore mean that he is actively conscious of the evils which give rise to it, at least in their full extent. I say actively conscious, because though the facts may have been brought directly to his notice with greater and greater frequency as the years pass, yet their constant repetition and their place in his work, as a seemingly ever present condition, may and probably do cause him to be for all practical purposes ignorant of them. We are all to a more or less extent acquainted with much that is hideous and painful in life, and yet our comfort is only occasionally disturbed by our knowledge, for that which is always with us is apt to be disregarded, and we only become what I call actively conscious of it when some aggravated form of misery or unusual disaster forces us to become so. It is not unlikely then that the engineer, having constantly to face those things which are responsible for the evils spoken of above, and with his mind upon the details of his profession and constantly battling with the difficulties which beset him, will become inured to those surroundings and conditions of his work, and in time, from very familiarity, become only subconscious them. It is well then, I think, under the auspices of such an association as this that the engineer, while giving an account of those direct benefits which his profession brings in its hand and of the means by which he aids in raising the standard of public health, should recall to mind such undesirable conditions with which he is acquainted, with a view to taking such possible steps as will lead to their gradual disappearance. The danger to the public health which arises from the use of machinery, we possibly will not be able to trace directly to its influence any more than many of the benefits which we enjoy can be seen at a first glance to be in its Some can be so traced and others may perhaps be said not to be caused by machinery at all, but constitute for the engineer a responsibility as a citizen to a greater degree than in the case of other men because of his special knowledge.

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According to statistics, compiled by the American Museum of Safety, more than 3,000,000 people in the United States are ill needlessly every year. Of this number 1,000,000 are in the working period of their lives. The report says:

"Social and economic waste in American railway systems, factories, mines and, in fact, every industry, indicates little regard for human life. Loss of life among the working class is caused largely by occupational diseases, industrial poison, unprotected machinery, noxious fumes, failure to remove dust, impure drinking water, ill-ventilated and generally unsanitary conditions. Upward of 40,000 workmen

are killed and 2,000,000 injured in industrial accidents in the United States every year."

There is no need for me to enter into detailed accounts of the conditions of labor in the various industries before a body of engineers; your knowledge must of necessity be greater than mine. Examining the above figures, however, one wonders whether 3,000,000 really covers all the cases of needless ill-health. If there are 40,000 workmen killed and 2,000,000 injured every year, for how much ill-health among women and children is this responsible. One feels sure that the Museum is well advised when it states that more than 3,000,000 are ill needlessly.

Although reports lead one to the belief that the United States has a far greater number of preventable accidents than any other country, and that, as a rule, the conditions of work are worse than anywhere else, still the above figures will give us some idea of the ill-health for which the machine is responsible the world over.

But, you may say, the machine is not responsible for all this; noxious fumes, bad ventilation, etc., have been cited among the causes. This is true, but every one of the industries of which these are conditions, are made possible by the machine. They depend at least for transportation of raw material and finished product on the machine, also the manufactures in which some of the products are used are carried on by machine power. There is a further connection between the public ill-health and machinery in the stunted bodies and degraded minds of these machine hands, who day in and day out perform the mechanical tasks which appear to be necessary in some industries.

Hearing the accounts of the soul-destroying monotony of these operations, one ceases to wonder at the craving for wild excitement which seizes on the operators when work ceases, and at the debauchery and vice in which it so generally results. One wonders if this class of labor is really a necessity or whether it is only cheap.

In as far as it is a necessity it stands as a challenge to the intellect of your profession; if not necessary it becomes a responsibility for the engineer as a citizen.

Whichever proposition is true such conditions are largely responsible for the de-

bilitated physique and stunted minds of the more ignorant part of our industrial population, and in so far as many of this class of workers are women it is difficult to arrive at any definite conclusions as to the ultimate effect on public health. And so, as our inquiry precedes, we can trace a wider and still wider connection, direct and indirect, between the development of machine power and public health.

Must manufacturing cities necessarily be so ugly, dirty and unhealthy; can we say that the depression they produce has no, effect, or a beneficial effect upon health? A piece of machinery of itself is far from unbeautiful; must its surroundings be so hideous?

Strikes and other troubles of the manufacturing industries, with their stimulus to social disease! Has the use made of the machine no responsibility? Is the laborer so often in the wrong as is so generally thought? If the public knew the truth, which it seldom does, if the laborer had the power of expression to enable him to tell the true conditions and the education to recognize what condition really constituted his grievance, which he very often cannot, would not our attitude on many questions be the reverse of what it is?

The report which I quote above continues with reference to a particular industry. "The press has recently been stirred to action and doubtless the evil will be measurably remedied, for when once public opinion in the United States is aroused it makes itself felt in no uncertain way.

It is the recognition of the truth of this statement that constitutes the hope of the social worker.

If one had to believe that people knew of and understood to the full the horrors that accompany industrial development one would not only have to give up hope of their amelioration, but must also be driven to question, whether if it were possible, it were worth while.

Fortunately we can be assured that human nature is naturally kindly and that ignorance is the chief cause of wrong and

The history of labor legislation supports this belief and if that history oft-times make sorry reading, it does hold out the

certain hope that as ignorance becomes informed the dreadful conditions which up to now have stained the splendid story of the rise and development of mechanical power will finally disappear.

Here lies the engineer's opportunity and responsibility.

While the mass of men remain ignorant of the true conditions, he knows. He not only knows of them, but none is so well able to suggest the remedy or to point out the absence of necessity.

Of the advisability of interference there can be no question. Men exclaim at the horrors of war, but are they greater than those of peace?

"Peace hath her victories as well as war," we say, intending to draw a distinction favorable to the arts of peace; but the price of these victories is the more dreadful.

Machine power many load us with benefits, but there are many who will be inclined to believe that we are paying too great a price. In suggesting to you that these facts call on you for greater social service I do not address you as individuals, for no one doubts that the members of your profession are at least as good citizens at other men, but I appeal to you as a class having representatives wherever an industry is carried on; representatives, able and informed.

It is to you that we can rightly and hopefully look for exact fact and foremedy.

Not only can you supply information a none other can, but you can speak throug your professional organizations with a authority that no other body can equal and is it too much to hope that the day will arrive when engineering associations will not only provide knowledge for the social worker, but refusing to allow the misus of the products of their hands and brain will also definitely place social service among their objects and take the initiative in the struggles for a saner social order.

So doing you will be taking the firstep towards conferring upon the race of men, benefits great enough to outweig even those immense gifts your profession has already bestowed, the products and accountages of mechanical efficiency.

HOW MAY THE MEDICAL HEALTH OFFICER HELP THE SOCIAL WORKER

By J. HOWARD T. FALK

General Secretary the Associated Charities of Winnipeg

Read before the Third Congress Canadian Public Health Association, Regina.

SUBMIT that the subject is not one which is capable of original thought or discussion.

In the fact that it suggests that the employe of a health department is not a Social worker, or is in a class by himself, I find my chief opportunity for discussion and suggestion which may be helpful.

On request I recently defined a Social worker as being any person, who exerted himself in the service of others beyond the requirements of the ordinary life of an individual, and the professional Social worker as anyone who did so and obtained a livelihood thereby.

Accepting this definition of a Social worker, my subject should be "How may the Social worker who happens to be a Public Health employe help other Social workers?" but before attempting to answer this I wish to suggest some reasons why public officials in general and private professional workers do not co-operate as closely as they should.

Not infrequently public officials make it clearly understood that they have adopted the motto, "Let me mind my own business and you mind yours," and not infrequently either the public official who adheres to this policy succeeds in the estimation of his superiors and the general public the better for it. Criticism, often unjust, generally unintelligent, almost always destructive and not constructive, has forced the adoption of the motto.

Now it is all very well for a man to mind his own business if his business has no relation to anyone else's; but just as a "man cannot live unto himself alone," neither can a public department.

The manufacturer who says his business is manufacturing and leaves the merchant

middleman and consumer to come to him would soon be out of business.

The Public Health official, whose duty it is to prevent Social disease and conserve public health, and who does not co-operate with the hundred and one agencies that are at work, either caring for the victim of social diseases or catering to the other needs of people most easily affected by social diseases, is not put out of business, because the amount of work or business for him does not depend on his co-operation with others-but he ought to be put out of business, for the chief aim of the social worker should be to work to efface himself-to put himself out of a job, and the public official who fails to co-operate will other social workers is not doing his best to efface himself.

Seven years' experience of social work as a professional social worker, and several years' previous experience as a volunteer, experience in three English speaking countries, England, the United States and Canada, has led me to the conclusion that the average private social worker likes to consider himself in a strata of society one higher than the subordinate official of a public department—the uniform of the public official may have something to do with this.

Experience has also led me to believe that the average public official believes himself a more important being than the private social worker—the fact that he works under orders from a Government elected by the people may have something to do with this.

In neither case should this relation exist. It should be customary and honorable for our so-called "best bred" citizens to enter public service at any time of life.

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ce of veigh ssion d adand so long as the State shirks, or public opinion does not ask the State to accept, the responsibility of undertaking the numerous social welfare undertakings at present engaged in by private boards of management, so long should public officials accept the necessity of the existence of these private officials and co-operate with them.

It is a lamentable truth that there are still men, the heads of big business enterprises, whose personal efficiency has made them wealthy men, men who would disdain to act as aldermen of their city, men who will be content to be inefficiently represented on a City Council, and who will so neglect their responsibilities as citizens as not to deserve the name, and yet will he content to hold honorary positions on the board of some charity, finding in it a salve to their conscience and even then, on the pretext of lack of funds, allowing salaries to be paid which they know could not buy them efficiency in any department of their own business.

Did you ever hear of a rich man leaving money to a Public Health Department? Did you ever hear of a college lady graduate with private means volunteering her service to a Public School Board? And yet, why not? A fountain, yes—a park or playground! yes—but personal service! no—not unless it is such as can be safely spared from the less busy years towards the close of a man's life.

The inefficiency of the underpaid private social worker may well be responsible for his being looked upon almost as a joke by the public official—the remote relation of the life of a Private citizen to civic government may well be responsible for the tendency of the private social worker to place himself above the public official; both tend to put off the day when the average adult person will be a good citizen worthy of the name and when a public social conscience will demand that the responsibilities of government shall be extended to cover every field of public welfare work.

The relation of the average man to his government is wrong—it is impersonal, apathetic and critical.

The fifty-two Sunday a year, twice a Sunday churchgoer, who gives his old clothes to the first itinerant beggar and his odd silver to the blind, lame and deaf on the street corner, who attends every chaity bazaar with all his family, and if rienough when his wife dies endows to Martha memorial home for girls, the vitims of his industrial greed, he is still to easily held a "good citizen" in the ey of public opinion, which is tea-table go sip and the daily press.

One practical way in which the pub health official can help the private soci worker then is by insisting on efficien in the latter's work at every point of co tact with himself; if efficiency is demanded of the private social worker by the pulic health official and is given, then the private social worker can require that be paid for efficiency and know that will be supported in his demand by the with whom he is co-operating.

The public health official, if intelliger will recognize in the course of his work to underlying causes of social problems, which in themselves make it difficult for to poorer members of his community to expore to public health law requirements.

In seasonal employment he will see cause for overcrowding in winter time; high rents another cause of this same ev an evil which itself is conducive to t spread of social diseases.

In the poverty of widowhood often cared by the "industrial murder" of the bread-winning father, he will see a care for overcrowding, dirty rooms and yarundernourishment and anything the makes for bad health.

Recognizing these he will not "mind own business," but will join social serviclus alongside volunteer and professional social workers, and add his quota evidence and give his share of service any movement for reform, legislative otherwise, which will tend to eliminate these conditions.

The social ills which require the social social are one at the same as those which brought prive social welfare agencies into existence.

If the ills are the same, the causes a the same, and both being the same, the te should co-operate to remove them.

When a public health official, in a proaching a family from his point of vie ascertains by chance a fact of social s nificance to any other social service agency public or private, he should report the

fact to the agency to whom the information will be of value; and how can he when he has no means of knowing what other agency is interested in this particular family?

The tenement apartment that to-night is found by the night inspector of the health department to be overcrowded and filthy may be, often is to the relief agent, the home of a struggling deserted woman—to the Children's Aid Society, the home of a drunken father neglecting his children, to the police, that of a mother of ill-repute, herself dragging a seventeen-year-old daughter into a life of shame, to the probation officer, that of John, an embryo bicycle thief, to the Anti-Tuberculous Society, that of Annie, a three-year-old consumptive.

Half a dozen agencies may, and frequently do, work for the betterment of a family at the same time or within a short time of each other, ignorant of each other's knowledge of the family.

In one way, and in one way only, can this be remedied, and that way is the establishment of a confidential exchange, at which every agency will inquire for information concerning every family, every fresh time it is brought to their notice.

Oh! let us, if social welfare work is

worth while at all, do it intelligently, let us test our efficiency by business standards.

The clearing house is an absolute necessity to the grain broker and banker, on account of the complexity and volume of their business. The clearing house or confidential exchange is an absolute necessity to social workers on account of the complexity of our modern city life, without it our work must be conducted with gross waste of time and money and at enormous sacrifice to the intelligence of our treatment of those we strive to help.

To sum up, is it not this? Social welfare is a business, containing more difficult elements in it, on account of its closer relation to human character, than trade, commerce or manufacture, which mostly concern themselves with inanimate objects. a business which demands that all those engaged in it should forget class and ereed, personal ambition and competition, in order to reap as big a dividend, year by year, of human welfare and human happiness as possible; and being so, is not cooperation the keynote of this business above all others; if people, who are competitors, find co-operation essential, how much more so is it necessary for those to whom competition should be an unknown



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The August issue is smaller than usual for very good and sufficient reasons. The chief is that we have decided to publish our Journal on the 1st of each month instead of the 15th. We are certain that this will meet with your approval. The September issue therefore will appear on the 1st of that month and thus we are obliged to sandwich in a smaller number in August. You will notice that several features which are proving of tremendous interest to our readers are left out. In September we shall be in full sail once more.



Every little while our attention is directed to an article in some daily or weekly periodical extremely favorable to curselves. The latest to find its way to our desk is to be found in the Welland Telegraph. You will be glad to know that we are meeting with the approval of the general reading public.

A publication of more than ordinary interest and value is the Public Health Journal published in Toronto. This monthly, as its name implies, is devoted exclusively to matters per-taining to health. In every issue there are a number of informing articles by experts on some phase of the fight against disease. The Telegraph extends its congratulation to the Public Health Journal upon succeeding so well in a very useful career.



The religious weekly mentioned in our May number under "Ethics" has followed the course which we were certain would be followed as soon as attention was called to the number and nature of the fake advertisements carried in its columns. In its issue of July 23rd there was only one questionable advertisement, small in size, viz., "Baby's Own Tablets." We congratulate this religious weekly on its improved advertising columns and trust that even this small advertisement may be deleted as well.



The Annual Meeting of the Canadian Association for the Prevention of Tuberculosis recently held in Halifax was the best yet. Dr. George D. Porter the very efficient Secretary of the Association has voiced the following sentiments with reference to the work.

We are pleased to note that the Federal Government is taking steps to prevent the spread of tuberculosis through milk from infected An Order-in-Council has been passed authorizing regulations providing for the co-operation of the Federal authorities, and cities and towns all over Canada, for the eradication of bovine tuberculosis from herds supplying milk to such municipalities. It is specified that the city or town must first provide for licensing all milk vendors, for clean and sanitary dairies for the prohibition of the milk sales within two years of the test of the cattle of any dairy unless a clean bill of health is shown, and for the appointment of a Municipal Inspector. On fulfilment of these conditions, and on application being made by the Municipality to the Veterinary Director General, Federal Inspectors will be sent to make tuberculin tests. Any diseased cattle are to be slaughtered, and compensation to the owners is to be allowed at the rate of one-half the appraised value of the cow in case of open tuberculosis, and one-third the value if destroyed as a re-actor at the request of the owner. No compensation is to be paid to the owner unless, in the opinion of the Minister of Agriculture, he assists as far as possible in carrying out the instructions of the Inspector as to disinfection and other necessary precautions. The complete regulations will be found elsewhere in our report.

All this, we submit, is a great advance over

conditions some twelve years ago when there was only one institution for the tuberculous in Canada with about 100 beds available. Now we have thirty institutions with over 1,500 beds.

Besides the growth of the newer institutions, the older ones, in the majority of cases, show a commendable progress. Without detailing these, at might suffice to mention the Open Air School for tuberculous children in connection with the Royal Edward Institute, Montreal, opened this year, following the lead of the Hamilton Health Association in this matter. The greatest difficulty in most of our institutions, however, is the cost of maintenance.

In Nova Scotia legislation is also being passed whereby medical examiners are to be appointed in various parts of the Province to detect the cases of tuberculosis, and also the appointment of visiting nurses to attend the patients in their homes when such patients do not go to the Sanatorium at Kentville.

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We are also encouraged to know that the fruits of public education along the lines of prevention, and the need for adequate accomodation for the tuberculous are visible in the increasing number of sanatoria and hospitals throughout Canada, in the growth of the Preventoria and Open Air School movement, in the greater number of visiting nurses employed, and in the increased attention to sanitation and fresh air everywhere.

Since our last Annual Convention held in Ottawa in March, 1913, no less than nine institutions for the tuberculous have been formally opened. These include the Perley Memorial for Incipient Cases at Ottawa, opened by His Royal Highness, the Governor General, during that Convention, the Brant Sanatorium, Brantford, Ont., the Mount Sinai Sanatorium, St. Agathe, Que., the Essex Sanatorium, near Windsor, Ont., the Jordon Memorial, River Glade, N.B., the Home for advanced Cases in Halifax. Preventorium erected by the Imperial Order the Daughters of the Empire, Toronto, the Queen Mary Hospital for Tuberculous Children erected by the National Sanitarium Association at Weston, Ont., together with the Connaught Home for Nurses, erected by the same Association in the same place this year. The new Preventorium erected by the London Health Association at Byron, Ont., completes this, the record year, for such work in Canada.

Besides these there have been extensive additions to the Provincial Sanatorium at Kentville, N.S., while the Sanatorium at Freeport, Water-loo County, Ont., is about ready for occupancy, and the Provincial Sanatorium at Kappelle, Sask., is now in course of erection.

Alberta and Prince Edward Island are also making moves in this direction, the former is working for a Provincial Sanatorium through the efforts of the Provincial Association recently organized there. The Government promises to assist in the building and allow a maintenance grant, while in Prince Edward Island the movement is indebted to a public spirited citizen

who has donated \$20,000 and an annual allowance for the purpose of erecting a local sanatorium.

The City of Calgary has voted \$30,000 for a municipal hospital for the advanced cases there, following the lead of the City of Winnipeg, which was the first municipality in the Dominion undertaking this work. The Society in Quebec City have also raised over \$60,000 for the same purpose there. The city has also voted a grant towards this object

The average cost for each patient per diem in the 12 sanatoria reporting on this matter is \$1.52, or \$11.34 per week. This is about the same as the average cost in the United States. The maintenance grant from the various Provincial Governments, apart from the assistance they have allowed towards the initial cost of construction, which has differed widely in various Provinces, is as follows:-British Columbia \$7.00 per week for advanced cases, and \$4.55 for incipient cases. Saskatchewan \$3.50 per week. Manitoba allows \$2.80 per week, while Ontario gives \$3.00 per week, and the Municipalities contribute \$3.50. Neither Quebec nor Prince Edward Island have a maintenance grant but New Brunswick intends supporting the sanatorium at River Glade, and Nova Scotia makes up the deficit at Kentvalle amounting to something over \$7.00 per week. These subsidies average approximately \$4.40 per week. (In Nova Scotia the Sanatorium was built and equipped entirely by the Government.)

It will be seen from this that more money will have to be allowed for maintenance in making up the deficiencies which are hampering the work in a number of our institutions, and, unless the Federal Government assists the Province, the Provinces, the Counties or the Municipalities will have to increase their allowance if the work is to go on.

While we all desire that every home should be as clean and as sanitary as a well run sanatorium, yet the need for a growing minority of the tuberculous is the treatment and supervision which can so often best be given at the institution; while hospital accommodation for the advanced cases, for those who would otherwise be sources of infection in their homes, is absolutely necessary if we are to get this disease under control.

Although this brief summary deals largely with the special agencies, it must not be supposed that the mere multiplication of hospitals, sanatoria and dispensaries, however necessary, are sufficient weapons against tuberculosis; for, while the proper care of the tuberculous is of the utmost importance, and the segregation of advanced cases imperative, yet consumption cannot properly be controlled until we improve those conditions favouring spread of the disease.

We must have pure food, pure water and clean milk, proper ventilation and light in the homes, schools and workshops, and unsanitary conditions so prevalent in so many of our cities and towns, as well as in our farm houses, must be improved, and better housing conditions must prevail if our present annual death rate from tuberculosis is to be materially reduced.

We are pleased to note the growing interest in our housing problem, and to congratulate, the Conservation Commission upon its educational efforts along this line, and also those organizations undertaking a practical interest in this great social problem. The extension of the domiciliary visits by district nurses is a noteworthy improvement in this campaign. Some of these nurses are under the auspices of the Local Anti-tuberculosis Society, others under the local Boards of Health, others again belong to the Victorian Order of Nurses, who are doing such splendid work over the whole Dominion.

In conclusion, we take pleasure in commending the great fresh air campaign instituted and kept up largely by the many Canadian newspapers. Such movements all assist in preventing tuberculosis, not only by teaching the value of rest and fresh air, but by enabling so many children and over-worked mothers to enjoy a much needed vacation, thus raising their resisting powers against the invasion of the germs by which, unfortunately, their homes are too

often contaminated.

The following officers were elected:-

Hon. President., H. R. H. The Governor General. Hon. Vice Presidents, Rt. Hon. Sir R L.

Borden, K.C.M.G., Premier of Canada. Rt. Hon. Sir Wilfred Laurier, G. C. M. G. Hon. Martin Barrell, Minister of Agriculture. His Honor Sir Francois Langelier, K. C. M.

G. Lt. Governor of Quebec.

His Honor J. McGregor, Lt. Governor of Nova

Scotia. His Honor L. J. Tweedie, Lt. Gov. of New

Brunswick.

His Honor Sir J. Morrison Gibson, K. C. M.

G. Lt. Gov. of Ontario.

His Honor Sir D. H. McMillan K. C. M. K. Lt. Gov of Manitoba.

His Honor D. A. McKinnon Lt. Gov. of P. E. Island. His Honor G. H. V. Bulyea, Lt. Gov. of

Alberta.

Alex Henderson Esq. Com of Yukon Territory.

President Col. Jeffrey H. Burland. Montreal.

President Col. Jeffrey H. Burland, Montreal. Vice Presidents, Lt. Col Albert Gooderham, Toronto.

His Grace the most Rev Chas. Hamilton, D. D. Archbishop of Ottawa.

Lorne McGibbon Esq. Montreal.

James Manual Esq., Ottawa.

Hon. A. K. McLean, Halifax.

Dr. John Stewart, Halifax.

F. W. Summer Moncton.

Hon. W. J. Roche, Minister of Interior.

Dr. Shafiner M. P., Manitoba.

Dr. Torrance, Vet Director General Ottawa.

Hon. G. H. Perley, Ottawa.

Hon. G. H. Perley, Ottawa. Dr. T. Wisbrook, Vancouver. Hon. Dr. Young, Victoria. Hon. Mr. Dalton, P. E. Island.

Hon. Treasurer, Geo. Burn Esq., Ottawa.

Secretary, Geo. D. Porter Esq., M. B. Toronto. Exectuive Committee Dr. J. B. Black, Windsor V. S.

J. A. Machad, Ottawa.
Dr. J. H. Elliot, Toronto.
Dr. J. H. Holbrook, Hamilton.
Dr. Harold Parsons, Toronto.
Dr. A. P. Proctor, Vancouver
Dr. J. D. Page, Quebec.
Dr. Murray McLaren, St. John.
F. W Summer, Moncton
Major J. W. Leonard, St Catharines.

Dr. Porter believes that to bring about the reforms, hoped for by the Association, we must have a Federal Department of Public Health. The sentiment for such a Department is growing stronger every day throughout the whole of Canada.



On the 6th of June the 14th annual meeting of Virol, Limited, was held in London, England, and the President was able to announce a very large increase of sales throughout the world, although several countries are suffering severely from financial depression. The larger part of the sales are made on the prescription of Virol by doctors to their private patients but the use of the preparation has enormously increased in hospitals and sanatoria for consumption.

The president gave particulars of the laboratories instituted by Virol, Limited which are under the direction of Dr. Ed ward Burnet, and of the work done in those laboratories. They are available to the medical profession, and doctors from all parts of the United Kingdom have made use of the facilities offered for general bio-chemical and physiological works.

The president also states as regard Virol that scientific investigation at thes laboratories has shown that a Virol die gives increased power to the blood cells and that the white cells are not only greatly increased in number, but their ability to deal with disease germs of a kinds which may succeed in making a entrance into the system is much augmented.

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THE CANADIAN PUBLIC HEALTH ASSOCIATION

FOURTH ANNUAL CONGRESS

FORT WILLIAM-PORT ARTHUR

Thursday, Friday, Saturday,

September 10th, 11th and 12th, 1914

It merely remains for us to tell you that we are anticipating a very great Congress at the Twin Cities. To make it a great Congress we are anticipating a large delegation, a splendid list of speakers, and a deep interest in matters of Public Health. The members of the Thunder Bay Medical Society have worked steadily, month by month, until all arrangements are now complete. They are the hosts, together with every citizen of the two cities and their hospitality is second to none in Canada. In September, Thunder Bay is at its best. There is no finer trip than that up the great Lakes of Huron and Superior. You had better come with us for we need your interest and support as we endeavor to improve Public Health conditions in Canada. They say we shall find four Special Features, when we arrive.

Special Feature No. 1.—Findings of the International Waterways Commission and their interpretation.

Special Feature No. 2.—Symposium on the "Undesirable Immigrant."

Special Feature No. 3.—Contributors and Topics of Section Meetings.

Special Feature No. 4. - Contributors to General Sessions.



THE TRAINING OF OUR ORDERLIES

By MISS MARGARET MacDONALD

Nursing Sister, Permanent Army Medical Corps

Read before the Association of Officers of the Medical Service of Canada, Ottawa, Feb., 1914.

THE title of this paper particularly suggested itself to me some little time ago, when, in the interest of a serious operative case, I had occasion to make "rounds" at night. Having, earlier in the evening, impressed upon the N. C. O. and orderly in charge the necessity for great watchfulness, and the importance of immediately reporting any adverse symptom, I was relieved in mind upon their assurance, "We'll watch him close, Sister." But

they had reckoned without the great god Morpheus.

Upon going to the dimly lighted ward, shortly after midnight, I found the patient quite awake, whilst seated at either side, their arms resting firmly on, and their heads touching the centre of the bed, were the N. C. O. and his orderly both drunk with sleep, and dead to the world of the sick and weary. It was by no means a gentle shaking that was required to wake them up, and their only apology, "Just couldn't help it, Sister," served only to heighten my anger that they should be so lacking in a sense of responsibility. Yet we must at least give them credit for taking by their position the

precaution to insure against the patient getting out of bed!

After harshly reprimanding them, I returned to my office, with the firm intention of reporting the circumstances and having them punished to the extent the regulations permitted. Presently, when I too was being overcome by physical weariness, my resentment grew less, especially when I remembered that these men had then been on duty seventeen hours and had still thirteen to go. In the midst of my reflections came, with startling suddenness, the thought "Are we doing our duty towards the orderlies?" And, since that time, this same thought comes to me with greater force and greater frequency. And the more I look into the situation, the more I study the case of the orderly from a humanitarian as well as from a professional point of view, the stronger becomes my conviction that some change should be made both in the training and treatment of orderlies.

Now, it is hardly necessary for me to say here that the few observations to follow are not made in any spirit of criticism nor by way of fault-finding, but with a sincere and whole-hearted desire to increase the nursing service

in the corps of which we are all, at once, so jealous and so proud.

It has often been well and truly said that "a chain is as strong as its weakest ling," and so the strength of any military hospital organization de-

pends altogether upon the various forces that go to make up the complete whole.

You will agree, more especially those of you directly connected with hospitals, that the work of an orderly is very important, very necessary, at times very arduous, and, I might add never done. In order that you may, perhaps, the better appreciate the remarks I am about to make, allow me to bring before

you a picture of the daily life of an orderly in the P. A. M. C.

He rises at 6.30, takes over the ward at 7 a.m. First, he sees that all patients are washed and breakfasted. When the dishes are cleared away and washed, the ward-cleaning, dusting and floor polishing is done. Next comes the taking of temperatures, the carrying out of prescribed treatments which invariably include some or all of the following: Medicine, fomentations, poultices, iodining, massage and backs to be rubbed. By the time one or two bed baths have been given and the linen changed, new patients have arrived. These must be put to bed and their kits drawn. It is now 10.30 and all is in readiness for the medical officer whom he accompanies on his rounds. The interval, between this and noon, is spent in doing dressings, carrying out further or new treatment, and in the making up of diet summaries, in itself no small item; clothing of the newly admitted is inventoried and turned into pack stores, and the ward supply of linen drawn.

Now comes the patients' dinner hour and again the clearing away of dishes. After this the orderly has his own dinner and, possibly time for a smoke, but, mark you, whilst away from his ward he is still responsible at this hour, for what goes on in the ward. Should the cases permit, he is off duty from 12 to 2, and on again in any event till 6 p.m. Naturally, with the dressings and ward cleaning done, work is less strenuous in the afternoons, but there are the lectures to attend, usually as many as three or four per week. In addition to all this special or skilled labor an orderly must be more or less of a general utility man, and is diable during the course of any afternoon to be called upon to make up prescriptions, respond to 'phone calls, and be prepared to go outside the hospital on messages. During his absence on one or other of these errands one might expect a substitute would fill his place in the ward. But no, the cook or one of the clerks, or somebody as remote as possible "answers" for him. Consequently, if things go wrong in the ward no one can be held directly responsible.

At 4.30 the suppers must be seen to, medicines and temperatures given and taken and other treatments carried out again. This brings us up to 6 p.m. when, if it is not his turn on night duty, there are two courses open to him—I can scarcely refer to them as recreation—either to go to bed or to the canteen.

Here we have then the regular daily life of an orderly, but, the picture is not yet finished. Every two or three days, according to the strength of the detachment, an orderly takes his turn on night duty. Now let us see when this night duty begins. Having arisen at 6.30 a.m. and carried out the above described routine until noon, he promptly "mounts" duty at 2 p.m. I never hear this word without realizing that to a great extent, its meaning to the orderly seems to be that he must override his patients, his work and everything else that interferes with his customary casual carelessness—a carelessness that is, possibly, a result of overwork and environment.

Now, he properly comes off at 2 p.m. of the following day, having done thirty hours duty, with no provision made for even so much as a cup of coffee during the long and tedious hours of the night. Such then is the ordinary, or I should say, extraordinary work of an orderly in the P.A.M.C.

And when we find this man who has been on duty from 7 a.m. of one to 2 p.m. of the following day, is expected to devote himself to the genuine

welfare of the sick, in addition to 'phone calls and other interruptions, for thirty consecutive hours, should we be surprised if he neglects his post to snatch forty winks?

Should we be astonished if patients sometimes find fault and we hear murmurs outside the hospital walls? Should we marvel if accidents occas-

ionally occur?

This is really overwork sufficient to wreck the most cheerful and optimistic of dispositions and to account for the stupid blunders we sometimes see. In truth, the old saying that "all work and no play makes Jack a dull

boy," holds better here than anywhere else I know.

Under these conditions there is no incentive for the men to give of their best; there is no promotion born of ability and merit; there is no provision made for proper recreation hours, and, if there were for this latter when would the men be available? After thirty consecutive hours without sleep, or, after twelve hours' duty and a supper of bread and butter, jam and tea, followed by the request that they stay around in case they might be required for a message or to fill a prescription.

And if, as occasionally happens, an orderly shows himself somewhat better than his fellows, takes a keen interest in his patients, and his work,

it at once becomes a case of.

"We never knew an orderly
But when he came to know his work and like it well
He was sure to be transferred——Elsewhere."

This goes to show that, at present, our ward orderlies are merely a recruiting ground for clerks and grooms.

Surely, this circumstance alone is sufficient proof, that there is room for

improvement in their training and development.

If I may be allowed, I should like to suggest a remedy—divide the men into two classes, nursing orderlies and general duty orderlies. The system of training might be revised, the men should qualify by competitive examination and promotion should come through merit and ability rather than automatically. The division into classes, with an increase in the number of orderlies would remove one of the greatest objections, i.e. the overwork.

The hours of duty would be shorter, the drones would be eliminated, and

the service much improved thereby.

Another point to which I should like to make reference is the matter of providing a means and the time for recreation. It is the great Wellington, who is credited with saying "The Battle of Waterloo was won on the cricket field of Eaton." A wholesome, healthy interest in sports and athletics with sufficient and suitable time for indulging in competitions would be of inestimable value to our men. In close connection with those outdoor sports would naturally come the provision for reading rooms and gymnasia. It is not too much to assume that these would prove very attractive to the men, would stimulate in them that natural desire to cultivate the finer feelings of nature, and, at the same time remove them from the deteriorating and destructive influences of the canteen.

Above all, it would send them back to their work with a renewed energy and the determination to more whole-heartedly devote themselves to the comfort and well-being of the sick. And, do we not all know how responsive to

cheerful surroundings, are the sick of mind or body?

Before concluding, let me remind you that I have not exaggerated, rather have I not omitted several details of the work that goes to the making of an orderly? For instance, the kit and equipment inspections, the daily and weekly parades, all of which are sandwiched in with the nursing.

Now, I trust I have not detained you too long, that I have impressed upon you the desirability of shorter hours for our men, in fine, that these observations will be received in the spirit in which they are given, a genuine desire to increase the efficiency and effectiveness of our hospital corps.



NOTES.

To be Captains-Lieutenant A. R. Perry, 25th October, 1913; Lieutenant

C. U. Holmes, 19th November, 1913.

To be provisional Lieutenants (supernumerary)—John Roger Fraser, 7th April, 1914; Andrew Robinson McMillen, 14th April, 1914; Thomas Richard Hanley, 1st May, 1914; Jean Marie Laframboise, 1st May, 1914; George William Sinclair, 1st May, 1914.

To be Quartermasters (supernumerary), with hon, rank of Lieutenant— William George Wright, 1st May, 1914; Staff-Sergeant William Herbert

Andrew, 6th May, 1914.

To be Nursing Sisters (supernumerary)—Beatrice Jean Blewett, 12th March, 1914; Emma Lillian Sarah Johnston, 11th May, 1914.

Provisional Lieutenant (supernumerary) C. S. Morton is permitted to retire, 7th May, 1914.

Provisional Lieutenant (supernumerary) G. A. Dubuc is permitted to retire, 15th May, 1914.

Dental Surgeon and Honorary Captain E. J. C. Chambers is retired, 18th April, 1914.

Quartermaster and Honorary Lieutenant H. W. Bromfield is permitted to retire, 22nd April, 1914.

Quartermaster and Honorary Lieutenant H. M. Taylor is permitted to resign his commission, 16th May, 1914.



CERTIFICATES.

The following certificates are granted:-

Major A. V. Becher, M.O. 6th Bty, C. Capt. G. H. Philip, A.M.C., Major. F. A., Lt.-Col.

Major P. G. Goldsmith, M.O. 2nd Q. O. R., Lt-Col.

Major E. G. Davis, A.M.C., Lt.-Col. Major F. Guest, A.M.C., Lt.-Col.

Major J. E. Davey, A.M.C., Lt.-Col. Major C. H. Gilmour, A.M.C., Lt.-Col. Major E. B. Hardy, A.M.C., Lt.-Col.

Major C. J. Currie, A.M.C., Lt.-Col.

Major W. B. Hendry, A.M.C., Lt.-Col. Capt. F. Winnett, M.O. 2nd Q.O.R., Major

Capt. A. C. Hunter, M.O. 33rd Regt., Major.

Capt. J. H. Wood, A.M.C., Major. Capt. W. Carrick, A.M.C., Major.

Capt. W. L. C. McBeth, A.M.C., Major Capt. N. J. L. Yellowlees, A.M.C., Major.

Capt. P. Lagueux, A.M.C., Major. Capt. F. J. Munn, A.M.C., Major. Capt. F. Walsh, A.M.C., Major.

Capt. J. J. Fraser, A.M.C., Major. Capt. W. F. Gallow, A.M.C., Major. Capt. D. P. Kappele, A.M.C., Major.

Capt. D. A. McClenahan, Major.

Capt. V. Ross, A.M.C., Major. Capt. R. P. Wright, A.M.C., Major. Lieut. R. St. J. Macdonald, A.M.C.,

Lieut. J. W. Hutchison, A.M.C., Capt.

Lieut. J. J. Marion, A.M.C., Capt. Lieut. G. A. S. Ramsey, A.M.C., Capt. Lieut. J. L. Petitelere, A.M.C., Capt. Lieut. R. E. Powell, A.M.C., Capt. Lieut. R. Wilson, A.M.C., Capt. Lieut. W. L. McLean, A.M.C., Lieut. Hon. Lieut. J. Roy, A.M.C., Dental Surgeon.

Hon. Lieut. J. D. E. Barras, A.M.C., Dental Surgeon.

M. Russell, A.M.C., Nursing Sister.

M. M. Mills, A.M.C., Nursing Sister. L. Brock, A.M.C., Nursing Sister. C. Green, A.M.C., Nursing Sister. M. M. Pugh, A.M.C., Nursing Sister. M. A. McKenzie, A.M.C., Nurs. Sister. M. Clint, A.M.C., Nursing Sister. F. H. Wylie, A.M.C., Nursing Sister. B. J. Willoughby, A.M.C., Nurs. Sister M. A. Follette, A.M.C., Nursing Sister M. C. Kennedy, A.M.C., Nursing Sister E. C. Doyle, A.M.C., Nursing Sister.



CONFIRMATION OF RANK.

The undermentioned provisionally appointed officers, having qualified themselves for their appointments, are confirmed in their rank from the dates set opposite their respective names:-

Lieut. O. C. J. Withrow, 1 Aug., 1913 Lieut. R. E. Wodehouse, 10 Oct., 1914 Lieut. J. A. Amyot, 1 Nov., 1913.

Lieut. J. E. Daignault, 17 Dec., 1913. Lieut. J. D. McQueen, 2 Jan., 1914.

Lieut. J. E. Hett, 17 Feb., 1914.

Lieut. G. C. Hale, 27 Feb., 1914. Lieut. J. B. Winder, 2 Mar., 1914. Lieut. H. W. Kerfoot, 25 Mar., 1914. Lieut. W. E. Ogden, 31 Mar., 1914. Lieut. G. McHume, 31 Mar., 1914.



TRANSFERS.

Quartermaster and Honorary Lieutenant R. Kirkpatrick is transferred from 6th Division to 4th Division.

Captain W. Bapty is transferred to the 31st Regiment "British Columbia Horse," 6th April, 1914.

Captain G. C. Corbet is transferred to the 28th New Brunswick Dragoons, 5th March, 1914.



LEAVE.

Leave of absence, with permission to travel abroad, has been granted as follows :-

Captain A. A. Campbell, No. 1 Clearing Hospital, from the 15th June to the 1st October, 1914.

Lieutenant H. George, attached 35th Horse, three months, from the 26th June, 1914.

POSTINGS.

Major T. H. Leggett reverts to the Regimental List from No. II Field Ambulance.

Major D. Donald reverts to the Regimental List from the 50th Regiment. Captain A. J. Ralph is detailed for duty as Medical Officer to the 30th Prince Edward Island Light Horse, 14th May, 1914.

Captain H. Orr reverts to the Regimental List from No. XI Field Ambulance.

Captain H. Orr is detailed for duty as Medical Officer to the 21st Alberta Hussars, 1st May, 1914.

Captain J. L. Duval is detailed for duty as Medical Officer to the 28th New Brunswick Dragoons, 30th May, 1914.

Captain W. B. Howell reverts to the Regimental List from No. IV Field

Captain and temporary Major J. A. Gunn is detailed to command No. XVI Cavalry Field Ambulance, vice Major W. L. Watt, transferred to the Regimental List.

Lieutenant (supernumerary) J. A. Lussier reverts to the Regimental List from the 64th Chateauguay and Beauharnois Regiment.

Lieutenant (supernumerary) J. A. Lussier is detailed for duty to No. XX Field Ambulance.

Lieutenant (supernumerary) J. S. Nelson is detailed for duty to No. II Field Ambulance.

Provisional Lieutenant G. A. B. Hall is detailed for duty as Medical Officer to the 50th Regiment, vice Major D. Donald, transferred to the Regimental List, 1st June, 1914.

Provisional Lieutenant (supernumerary) A. K. Haywood is detailed for duty as supernumerary Medical Officer to the 2nd Regiment (Queen's Own Rifles of Canada), 11th April, 1914.

Provisional Lieutenants (supernumerary) J. R. Fraser and W. A. G. Bauld are detailed for duty to No. IV Field Ambulance.

Provisional Lieutenant (supernumerary) A. R. McMillen is detailed for duty to No. XIV Field Ambulance, and to be borne supernumerary to the establishment.

Provisional Lieutenant (supernumerary) J. E. Lacoursiere is detailed for duty as Medical Officer to the 89th Temiseouata and Rimouski Regiment, 15th April, 1914.



Neterinary Hygiene

MONTHLY JOTTINGS

The Ontario Veterinary College Calendar for the session of 1914-1915 has just been issued.

In a perusal of it we find that students entering the College for the first time will be required to produce evidence that they have received an education equivalent to that which admits them to the third year of a High School.

. This is a higher standard of education than has hitherto been called for, and the authorities are to be complimented upon having made it so.

For those not holding the required credentials, examinations are to be held in certain prescribed subjects, upon September 1st, 1914, at the following points in the Dominion: Winnipeg, Vancouver, Medicine Hat, Regina, Charlottetown, Truro, Moneton, and at the Ontario Veterinary College, Toronto, on 2nd October, 1914.

This is a most commendable innovation. Those who write upon the examination will be notified of the results, and will thus either proceed with full confidence to undertake their professional studies or be saved the anxiety, time and expense of a perhaps very long, and possibly needless journey.

There is also established for a student who registers for his first year, 1914-1915, a course of four years' study, leading to the University degree of Bachelor of Veterinary Science (B.V.Sc.), the details

of which will be announced in the subsequent issue of this Calendar.

This is a move in the right direction. It has always appeared strange that the veterinary profession should in great part be packed with men "not sufficiently educated to be acceptable to other professions."

Vast educational progress has been made during the past few years, and if we are to seek to gain the respect and confidence of the public, and to desire recognition by other professions, it is the duty of those in whose hands the reins of leadership in educational matters are held, to offer to the student and to the members of the profession alike, an opportunity to advance with the times.

The advantages of a university education cannot be overestimated, and if advance equal to those for the forthcoming session are made during subsequent years we may reasonably anticipate a new era of progress for our profession in this

"The old-time invidious distinction between the callings of human and veterinary medicine will be swept away, both will work hand in hand; Chauvinism will be a thing of the past, comparative medicine will be recognized as an honorable and scientific study, and those who practise it will attain the positions to which they are fully entitled."

Let the good work go on !-A.R.B.R.



Statistical Report of the Division of Veterinary Inspection of Meat of the Department of Public Health of Toronto, for the First Six Months of the Current Year.

Four veterinary inspectors were en- to the 26 private abattoirs within the gaged in the work and made 1,339 visits city.

We have endeavored to maintain a standard of sanitation commensurate with the presently existing conditions.

Total number of food animals slaughtered 50.574, comprising:

Cattle											٠			15,502
Sheep														
Calve	s.		 		,	 . ,	*		*	*	×	*	×	9,976
Swine	2.					* 1		*	*		*		*	11,089
Goats														3

Total number of animals slaughtered subject to our inspection was 18,507, or 36.5% of the total number slaughtered. This total includes:

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Cattle.										.5,297=34.1% of total]
Sheep	a	nd		la	ı	n	b	S		.2,940=20.9% of tota	1
Calves.										.5,793=58.6% of tota]
										.4,477=40.3% of tota	
Gnate										2=	

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Percentage of animals evidencing some pathological or physiological condition necessitating either complete or partial condemnation was 6.4.

Carcasses examined and approved totalled 9.386, including:

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Beef.															*		3,601
Mutto																	2,265
Veal.											*	*	*				485
Pork.						*											3,034
Goat.																	1

Condemnations:

Cows 9	Generalized tuberculosis
Heifers 5	Generalized tuberculosis
Bulls 1	Generalized tuberculosis
Steers 1	Generalized tuberculosis
Hogs 1	Generalized tuberculosis
Calves69	Immaturity.
Veal10	Immaturity.
Calves 5	Omphalo phlebitis.
Calves 3	Pyelo-Nephritis.
Goats 1	Pyelo-Nephritis.
Heifers 1	Pleuritis.
Steers 2	Pneumonia.
Cows 1	Cysticercus Bovis.
Calves 1	Poly-Arthritis.
Sheep 1	Bruised.
Hogs 3	Improper bleeding.
Hogs16	Found dead or dying.
Hogs 1	Pleuro-pneumonia.

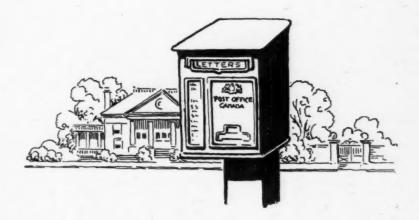
Total.....131 Carcasses.

Primal parts and portions condemned numbered 2,018, including heads, livers, quarters, hearts, sets of intestines, etc.

Animals found dead in cars or stockyards are tanked.

There were 285 animals "held" on ante-mortem examination to be killed subject to inspection.

A.R.B.R.



Forecast and Keview

THE DANGER IN WOOD ALCOHOL.

Call it wood alcohol or methylated spirits—it is the same thing, and one wonders how many house mothers realize the danger that lurks in the harmless-looking bottle.

Everyone knows in a general way that wood alcohol is poisonous, but few know the appalling number of cases of death or blunders that result from making fudge in a chafing dish, or making the morning coffee, as many a city shop-girl does, over a spirit flame. Few know that it is unsafe to burn wood alcohol or use it in any way in a room where the air is close. The bottle should never be uncorked unless the windows are wide open.

In most of the wood alcohol cases, says Laura Crozier in Good Housekeeping, the poison has been swallowed, a proceeding that would have been quite impossible up to 1906, when this was a vile-smelling, greenish liquid known as wood spirit, wood naphtha and methylated spirit. But at that time a cheap and effective means of "rectifying" it was discovered. Deodorized and deprived of its disagreeable taste. the new product was put upon the market under a number of alluring new names. It seemed just as good as grain alcohol, cost only a fraction of the price, and was soon being advertised and sold under its various aliases for "bathing and sponging the sick, rubbing for rheumatism, highballs, punch, hot-drops, witch hazel, bay rum, eau de colog. Florida water, essences of all kinds and bonemade wines and cordials." And then began the toll of death and blindness.

But pitiful story might be added to pitiful story telling of the awful results from using methylated spirits or wood alcohol for bathing or burning or cleaning. One painter was nauseated and later blinded while varnishing the inside of a closet in an hotel. Another became totally blind

after he had shellacked the benches and woodwork of several schools.

But even if the wood alcohol had been used in the open air, the danger of absorption through the skin would have remained. Dozens of such cases have been reported. In cleaning clothing a tailor absorbed enough wood alcohol to produce blindness. Hat makers suffer from a constant rash on the backs of their hands from the wood alcohol used in the stiffening solutions. Their sight is frequently affected.

Our neighbors across the line are ahead of us in having permitted the manufacture of an "industrial" alcohol which makes the use of wood alcohol totally unnecessary for most of the purposes for which it is used. This is pure grain alcohol to which small amounts of pyridine or benzine have been added. The benzine makes it undrinkable and gives a tell-tale, cloudy look to other liquors adulterated with it. This denatured alcohol costs 65 cents a gallon, and is said to have almost crowded wood alcohol out of the market in the United States. Not so, however, in Canada. The writer telephoned a Toronto druggist the other day and asked for "industrial" alcohol.

"Oh," he said, "you can get that in the States, but not here."

Here, in the meantime, we pay the price for pure grain alcohol or use the methyl spirits. And probably we use the methyl spirits anyway without knowing it. Essences have been found containing as high as 75 per cent. of wood alcohol. Only a few drops at a time, of course, are used in the ordinary household. But it is a cumulative poison. The percentage of people who are being slowly poisoned by the essences they swallow or the lotions they rub on their skins can only be guessed, for it is only in factories and other places where these poisons are used in large quantities that their results can be seen.

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Phagocytosis.

Its stimulation in relation to Tuberculosis.

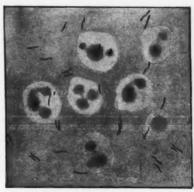
Convincing Evidence

TABLE OF RESULTS.

Duration of leeding with VIROL.	Average number of germs absorbed in 15 minutes by each Leucocyte.
0 weeks	1°1
2	1°3
6	1°5
9	3°8
12	4°5

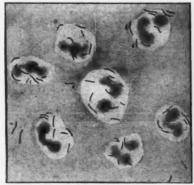
An elaborate series of investigations recently conducted at a well-known sanatorium has definitely proved that the addition of Virol to the diet exercises a remarkable influence on the phagocytic action of the leucocytes. The experiments showed there was a distinct and progressive increase in the functional activity of the white cells in proportion to the number of weeks the patient had been fed on Virol.

Proof from actual micro-photographs



BEFORE FEEDING ON VIROL.

From an actual Micro-photograph illustrating the deficient average Opsonic power of the Blood of a number of patients suffering from the debilitating effects of acute infections, before treatment with Virol. The average number of Bacilli ingested by each Polynuclear Laucocyte in fifteen minutes was 1'1, the Opsonic Index being o'45.



AFTER FREDING ON VIROL.

From an actual Micro-photograph illustrating the increased Opaonic power of the Blood of a patient after twelve weeks' treatment with Virol. The average number of Bacilli ingested by each Polynusiear Leucooyte in fifteen minutes was 4'5, the Opaonic Index being 1'5, Contrast this with the deficient average Opaonic power of the Blood of children of similar age not treated with Virol. (See opposite Micro-photograph.)

VIROL

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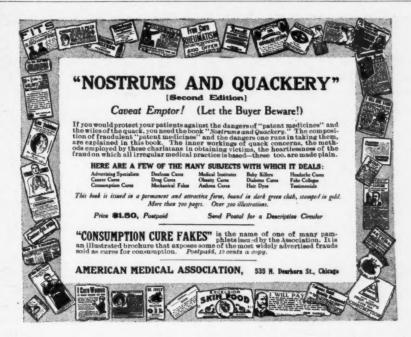
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The following circular is Printed on a card and will be sent to those making application for same:

HOW TO DEAL WITH THE FLY NUISANCE

House flies are now recognized as MOST SERIOUS CARRIERS OF THE GERMS OF CERTAIN DISEASES such as typhoid fever, tuberculosis, infantile diarrhœa, etc.

They infect themselves in filth and decaying substances, and by carrying the germs on their legs and bodies they pollute food, especially milk, with the germs of these and other diseases and of decay.

NO FLY IS FREE FROM GERMS

THE BEST METHOD IS TO PREVENT THEIR BREEDING

House flies breed in decaying or decomposing vegetable and animal matter and excrement. THEY BREED CHIEFLY IN STABLE REFUSE. In cities this should be stored in dark fly-proof chambers or receptacles, and it should be REGULARLY REMOVED WITHIN SIX DAYS in the summer. Farm-yard manure should be regularly removed within the same time and either spread on the fields or stored at a distance of not less than quarter of a mile, the further the better, from a house or dwelling.

House flies breed in such decaying and fermenting matter as kitchen refuse and garbage. Garbage receptacles should be kept tightly covred.

ALL SUCH REFUSE SHOULD BE BURNT OR BURIED within a few days, BUT AT ONCE IF POSSIBLE. NO REFUSE SHOULD BE LEFT EXPOSED. If it cannot be disposed of at once it should be sprinkled with chloride of lime.

FLIES IN HOUSES.

Windows and doors should be properly screened, especially those of the dining-room and kitchen. Milk and other food should be screened in the summer by covering it with muslin; fruit should be covered also.

Where they are used, especially in public places as hotels, etc., spittoons should be kept clean as there is very great danger of flies carrying the germs of consumption from unclean spittoons.

Flies should not be allowed to have access to the sick room, especially in the case of infectious disease.

The faces of babies should be carefully screened with muslin.

FLIES MAY BE KILLED by means of a weak solution of formalin (40 per cent.) exposed in saucers in the rooms. This is made by adding a teaspoonful of formalin to a pint of water. The burning of pyrethrum in a room is also effective.

House flies indicate the presence of filth in the reighborhood or insanitary conditions.

ENTOMOLGICAL DIVISION, CENTRAL EXPERIMENTAL FARM, OTTAWA DEPARTMENT OF AGRICULTURE, CANADA.

(Published by direction of the Minister of Agriculture.)

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Manager

The General Accident Assurance Company Toronto

Dear Sir,

I hereby acknowledge receipt of your Company's cheque for two thousand five hundred dollars in full payment of my claim.

The accident occured within two days of the taking out of my Policy I wish to express my appreciation of your prompt and unquestioning settlement of my claim and also the kindness which your Inspector and agent have shown me during my illness.

I shall most heartily recommend the General Accident Assurance Company to my friends and any who may wish to obtain accident or sickness protection.

Yours sincerely A. W. PECK

Mr. Peck, of Calgary, on a visit to his old home, applied for insurance through our Belleville, Ontario, Agency, on March 1th, 1914. on March 13th, while hunting, an accidental discharge of shotgun caused an injury necessitating amputation of foot.

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SIX FACTS from the 67th THE CANADA LIFE ANNUAL REPORT of ASSURANCE COMPANY

In important respects the Company in 1913 excelled its record for any previous year in its history.

THE SURPLUS EARNED in 1913 was \$1,709,959.66, exceeding by over \$179,000 the earnings of 1912, and by a much larger amount the earnings of any previous year. The present net surplus is \$6,183,278.39.

THE INCOME of \$8,094,885.70 was greater than that of the previous year by \$698,125.96, and the greatest in the Company's history. The rate of interest earned, which had been steadily advancing since 1899, was further improved in 1913. This is an important factor in producing surplus.

THE ASSETS were increased by \$3,860,271.32, and now stand at \$52,-161,794.81.

THE TOTAL ASSURANCES now in force are for \$153, 121, 363.94, an in-4.

crease of over \$8,273,000 in the year.
5. THE PAYMENTS TO POLICYHOLDERS in 1913 totalled \$2,878.016,11, an increase of \$415,051.31 over those of 1912. In addition to this, LOANS TO POLICYHOLDERS on security of their policy contracts were made for \$1,692,-248.71.

THE MORTALITY of the year was again more favorable than the expectation, and this, with a continued LOW EXPENSE RATIO, contributed to the earning of a record surplus.

-HYGIENIC SOLUTION-

of the Residence

Heating Question

For years "Gas Fires" have been regarded as experiments. Later Experiments, however, in Chemical Laboratories by scientists, have brought "Gas Fires" out of this stage and placed them on the market as practical gas appliances, as a perfect means of domestic heating. The design of the burners has received special attention until now it is possible to obtain "Gas Fires" that give perfect combustion. grates are very attractive in appearance. 55% of the total B.T.Us. in the gas is given out as radiant heat. 25% of the remaining B.T.Us. is given off as converted heat. The balance is used in creating a draught in the flue, removing the products of combustion, and thus also assisting in proper ventilation of the apartment.

Full testimony on request

The Consumers' Gas Co. of Toronto

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Explains how an injustice is done the physician and patient by prescribing unstable, inefficient and frequently fraudulent proprietary medicinal products.

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ANALYZE its contents and you will understand why the physician must be cautious so as not to be deceived by vague and mysterious statements regarding unknown proprietary remedies.

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American Medical Association

S38 North Dearborn Street CHICAGO, ILL.

How to Catch a Summer Cold.

It is not always the easiest thing to catch a summer cold. It often takes time and thought and proper exertion. You must be patient. Above all, never give up hope. Just when you think you are not going to get one, it will come along and seize you.

There are many recipes for catching a summer cold, which are doubtless familiar to the highly intelligent reader. We shall not give them. In their place we shall simply present a few general directions.

The first requisite is to get thoroughly exhausted. To do this it is better to select some unusual thing. When you have indulged yourself in this until you are tired out, then eat as much as you can of strange, food to which your stomach has heretofore been a stranger. This ought to bring on a summer cold within a reasonable time. If it doesn't, it will be because you don't know enough to have one.

The Benefit of the Doubt.

At the club the other night a member of the Seventh Regiment found himself the center of a group who were discussing the likelihod of an invasion of Mexico by the National Guard. Cheerful remarks about the penetrative powers of Mauser bullets peppered about him. Everybody had kindly suggestions to make—such, for instance, as that a medal neatly adjusted over each bullet hole would make him look as good as new. The victim took it very well.

'I'd like to contribute just one remark to this discussion,' he said. "If I'm reported shot in the back, remember that I may have turned around to encourage my men."—New York Call.

The Remedy for Hunger.

We are told that many children in New York go to school hungry. If so, it is their own fault. The remedy lies in their own hands, or it would if our authorities are anything like the English authorities, and we have no doubt they would be found so if brought to the test.

It is only necessary for the children to go on a hunger strike, to refuse to eat. That will entail upon the authorities, the necessity of feeding them forcibly.

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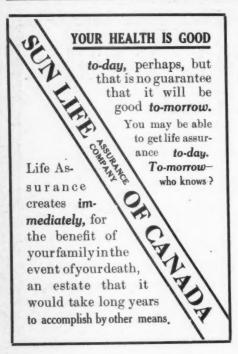


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"Are you married, my man?" a lady asked a sailor.

"Yes, indeed, mum-married and fourteen children.'

"Poor fellow, traveling about like this! And don't ever get homesick?"

'Only when I'm home, mum."

-London Opinion.

From Missouri.

A negro pastor failed to give satisfaction to his flock. A committee from the congregation waited on him to request his resigna-

"Look here!" demanded the preacher. "Whut's de trouble wid mah preachin"? Don't I argufy?'

"You sho does, eldah," agreed the spokesman.

"Don't I 'sputify concernin' de Scriptures ?"

'You suttinly does," admitted the other.

"Den what's wrong?"
"Well, eldah" stated the head of the committee, "hit's dis way: You argufies and you 'sputifies, but you don't show wherein!"—Saturday Evening Post.

And George Did.

The new battleship schools instituted by the Secretary of the Navy have made some startling contributions to literature. Here is the essay of a Filipino sailor who was told to write about George Washington.

George Washington was sore because Americal persons is not free. He sale to England on—— (naming his own battleship) and say to King "I express declaracion of indypendence for Americal persons." King he say "Nothin' doin' and Mr. Wasaingthan tell Admiral Dewey to shoot turret guns at him. Bime-by King he say he will not rule Americal persons egain. "Let George do it" say King and to-day Americal persons is free.

-Ladies' Home Journal

"What is the difference between a philosopher and an optimist?"

"Well, a philosopher takes things as they come, while an optimist, if they come with the dark side uppermost, turns them over."-Boston Transcript.

"GOOD AS GOLD"

ARE THE

POLICIES

London Life

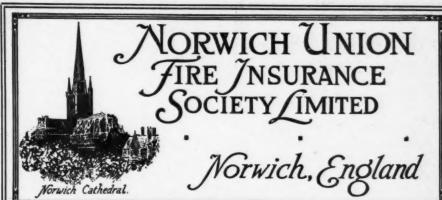
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Head Office, Torouto: King and Youde Sta.

This Picture, and That.

Disillusioned Bride: When I formerly dropped my handkerchief, how eargely you used to spring to eatch it. Now I have to pick it up myself. Alas, what a change a wedding ceremony will make!

Disgruntled Hubby: There's a reason, my dear; when I asked you for the bread of domestic happiness you handed me the stone of clubs and suffragism!

Moral-There are always two sides.

Proving His Case.

She looked at him doubtfully after the proposal. "The man I marry," she said, "must be both brave and brainy."

"Well," he declared, "I think I can lay just claim to being both"

lay just claim to being both."
"I admit you are brave," she responded,
"for you saved my life when our boat upset the other day; but that wasnft brainy,
was it?"

"It certainly was," he retorted. "L upset the boat on purpose."

—Ladies' Home Journal.

A Rare Chemical.

Professor (to inattentive student).—Mr. Blank, you may tell us something of the occurrence of CaCO₃ in nature.

Student-Why-why it is very rare, sir.

Professor—Very good, sit down. You neglected to state that the Appalachian Mountains are composed of this rare substance.—The Chemist-Analyst.

Was it Dr. Brown.

Mr. Brown had just registered and was about to turn away when the clerk asked:

"Name!" echoed the indignant guest. "Don't you see my signature there on the register?"

"I do," returned the clerk calmly.
"That is what aroused my curosity."

—Everybody's

Mrs Hatterson: I've just been trying a new servants' agency. Where do you get yours?

Mrs. Catterson: Europe, Asia and Africa.

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Amount	increased	at er	nd of 5	years	to			\$2070.00
66	44	46	10	66				2150.00
44	46	68	15	46			-	2210.00
44	66	44	20	44		-		2300.00
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Assured paid 10 premiums of \$112.00 each. Receives \$231.19 for every \$100.00 invested, that is, his money returned with compound interest at 4½%, in addition to insurance protection.

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Investment vs. Speculation

"A high return should at once excite suspicion in the mind of the prospective in-or."—Financial Post. vestor.

There are securities which promise a high rate of interest and the chance of an increase in value, but for those dependent upon the income from their investment, or endeavoring to lay up money for their old age, they are too speculative. With such, the Bonds of the Canada Permanent Mortgage Corporation are a favorite investment, because they know that if they invest \$1000 in these Bonds they will get the \$1000 when it becomes due, and that the interest upon it will be promptly paid in the meantime.

These bonds may be obtained in any sum from one hundred dollars upward. They are, therefore, available for the investment of small sums.

Canada Permanent Mortgage Corporation

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ESTABLISHED 1855

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Paid to bereaved relatives		-	8	6,190,921.
Paid in endowments		-		3,326,241.
Paid in dividends -	-	-		2,664,077.
Paid for surrendered policies	-	-		2,077,260.
Paid in all				14,258,499.

And it holds to guarantee absolutely the payment of future obligations 18,095,939.

The Mutual Life Assurance Company of Canada Waterloo Ontario

Is therefore termed "The Efficient Company."

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ESTABLISHED 1867.

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Alexander Laird, General Manager. John Aird, Assistant General Manager
Paid-up Capital \$15,000,000

HEAD OFFICE, TORONTO.

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In addition to the offices named above, the Bank has branches in every province of Canada and is therefore particularly well equipped for the handling of collections and the transaction of every description of banking business.

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Travellers' Cheques are a most convenient form in which to carry money when travelling. They can be used either at home or abroad and the exact amount payable in foreign money is printed on the face of each cheque. The cheques are issued in denominations of \$10, \$20, \$50, \$100 and \$200, and are obtainable at any branch of the Bank.

Letters of Credit issued negotiable in all parts of the world.

The Metropolitan Life Insurance Co

wrote more Ordinary insurance in the United States and Canada in 1913 than any other company. The amount was \$230,563,693, which was all the law permitted it to write. In Canada the amount of Ordinary written was \$18,275,895.

It furnishes Industrial life insurance to wage earners substantially at cost. It has in Canada almost 700,000 Industrial policies outstanding, which are held by workingmen.

In an attempt to lessen the death rate it has established a free nursing service, and in 1913 Metropolitan nurses made more than 1,127,000 visits to 175,757 sick Industrial policyholders, free of charge.

The Company has distributed millions of pamphlets giving valuable hints on the improvement of health conditions and the prevention of disease.

 It has on deposit, with the Dominion Government and trustees, for the protection of Causdian policyholders, nearly sixteen-and-a-half million dollars of securities.

It paid in 1918, 167,017 policy claims, amounting to \$27,801,848.12.

Assets - \$447,829,229.16 Capital and Surplus - 35,584,901.65 Liabilities - 412,244,327.51

(According to the report for 1913 filed with the New York State Department.)

Metropolitan Life Insurance Co.

1 Madison Avenue

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Certainly tires have to be strong and reliable to stand up under some of the tests which impatient drivers inflict upon them. Dunlop Traction Treads are surviving that kind of test every day.

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66 inches larger



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